

CATALOGUE  
OF  
**STEAM CULTIVATORS,**

**STEAM PLOUGHES,**

**CHAMPION PLOUGHES,**

**HARROWS, HORSE RAKES, HAYMAKERS,**

**AND OTHER AGRICULTURAL IMPLEMENTS,**

MANUFACTURED BY

**JAMES & FRED<sup>K</sup> HOWARD,**

**BRITANNIA IRON WORKS,**

**BEDFORD.**

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**LONDON OFFICE:**

**4, CHEAPSIDE, E.C., THREE DOORS FROM ST. PAUL'S.**

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**APRIL 1, 1867.**

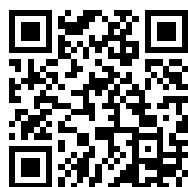
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HOWARD'S STEAM CULTIVATING APPARATUS ON THE SINGLE ENGINE SYSTEM.

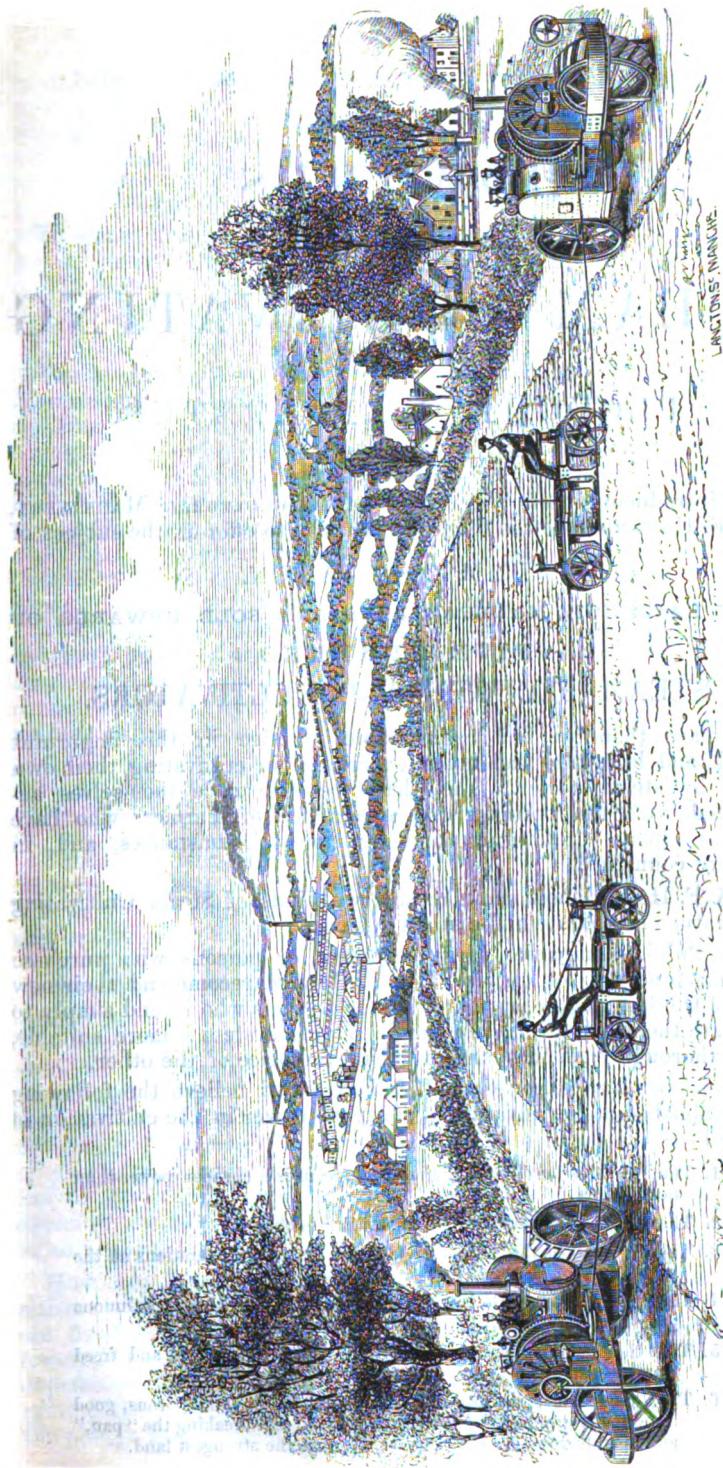


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Price of a Ten-horse set, with Portable Engine, complete as above, £530.  
Price of a similar set, but with Patent Twelve-horse Ploughing Engine with Double Drums, instead of a Portable Engine and Windlass, £800.

LANCASHIRE.

HOWARD'S STEAM CULTIVATING APPARATUS ON THE DOUBLE ENGINE SYSTEM.



Price of a pair of Fourteen-horse Engines, with Single Drums and Apparatus, complete as above, £1350.

Price of a pair of Fourteen-horse Engines, with Double Drums and two Cultivators, for working simultaneously on J. & F. Howard's newly patented method, £1550.

# HOWARDS'

## PATENT

# STEAM CULTIVATING

AND

# PLOUGHING APPARATUS.

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In introducing their CATALOGUE OF AGRICULTURAL MACHINERY, J. & F. HOWARD have the following remarks to offer on the subject of STEAM CULTIVATION.

THEY HAVE NOW MANUFACTURED AND SOLD UPWARDS OF FIVE HUNDRED STEAM PLOUGHS AND CULTIVATORS.

They have therefore had considerable practice in this important branch, and have also had much experience in cultivating their own farms by steam power. They have, besides, made themselves acquainted with the opinions and experience of Farmers who have adopted Steam Cultivation, under various circumstances, and in different countries.

J. & F. Howard now manufacture two kinds of Steam Cultivating Apparatus on separate and distinct systems.

For Public Companies, large occupiers, or persons who purchase such machinery to let on hire, J. & F. Howard recommend their new Patent Double Engine system; but for persons who intend simply to cultivate their own farms, the Single Engine system is more suitable, being thoroughly efficient, and only half the price of the other.

After ten years' experience, J. & F. Howard believe the following are established as the advantages of steam power in the cultivation of the soil:—

1. That for the hard work of the farm, steam is a cheaper power than horse power.
2. That deeper and more efficient cultivation is obtained.
3. That it enables the farmer to perform his tillage operations at the best season of the year.
4. That better crops with less manure can be obtained, by continuous deep tillage, especially on clays and loams.
5. That the land may be more quickly and effectually cleaned and freed from weeds.
6. That tenacious soils are rendered more friable and porous, good drainage is promoted by stirring the subsoil and breaking the "pan," and open furrows are unnecessary, even on the strongest land.

7. That the Steam Cultivator, Plough, or Harrows may be frequently worked to advantage in an unfavourable season, when it would be impossible to work with horses.
8. That not only a considerable diminution in the number of horses employed can be effected, but that the horses which are still necessary can be kept at less expense, being relieved of their most laborious work.

To secure these advantages, the Apparatus should be—

Simple in its construction,  
Easily understood and managed by ordinary farm labourers,  
Readily adapted to work in any desired position,  
Moderate in its first cost, and  
Economical in wear.

The satisfaction expressed by the numerous purchasers of J. & F. Howard's Steam Cultivating Machinery proves that their efforts to combine these features have been most successful: they do not know a single farmer who has adopted their Apparatus who would return to horse power for his tillage operations. [See Reports from Purchasers in J. & F. HOWARD'S STEAM PLOUGH CATALOGUE.]

J. & F. Howard have pleasure in stating that they have introduced additional improvements, which effect a saving of power, add to the durability of the Apparatus, and greatly reduce the wear of the steel ropes.

The Apparatus, illustrated on page 2, is adapted for hilly as well as flat land, and for irregularly shaped as well as square fields. As the Engine and Windlass are stationary while in operation, the expense of carting water is often avoided by digging a pond or well at convenient points; and if set in an adjoining field, which is recommended when practicable, the whole field can be cultivated, headlands included, without the Engine being taken into it. As many as 40 or even 50 acres of land can be advantageously cultivated without any removal of the Engine or Windlass.

From 7 to 10 acres a day can be broken up with an ordinary 8 or 10-horse Portable Engine. The Engine requires no alteration whatever, and is of course available for thrashing, &c., when not required on the land.

#### HOWARD'S APPARATUS ON THE SINGLE ENGINE SYSTEM.

HOWARD'S PATENT WINDLASS is of the most simple construction. The winding drums revolve on a very strong wrought-iron axle, attached to brackets which carry the driving shaft and a pair of travelling wheels. This arrangement affords great strength and stability. The windlass is very portable, and is quickly set down to work. By a simple lever movement, the winding drums drop out of gear instantaneously, which enables the windlass-man to attend to the proper coiling of the rope, on which its preservation so much depends; and also, in case of accident, to stop the plough or cultivator in an instant, without stopping the engine.

HOWARD'S PATENT DOUBLE-ACTION STEAM PLOUGH is made for either two, three, or four furrows. The right and left hand ploughs are fixed to very strong flanged steel frames, which are raised and lowered in such a manner that the set of ploughs out of work is independent of, and has no tendency to weigh, or raise out of the ground, the set in work. By substituting suitable breasts and shares, the plough may be used for scarifying, digging, ridging, or subsoiling.

HOWARDS' PATENT DOUBLE-ACTION STEAM CULTIVATOR effectually cuts up the land at one operation. It is made with a very strong flanged steel frame, and is fitted with five tines, but can be used with four, three, two, or one, according to the depth and tenacity of the soil. The shares are made of various widths, from two inches, up to thirteen inches, and are furnished with prongs, which lift up the soil and leave it loose. A Harrow can be attached to the side of the Cultivator, to work the ground already turned up, thus effecting two operations at one time.

HOWARDS' PATENT STEAM HARROWS are on the same principle as their Drag Harrows for horse power, but made to work either backward or forward, like the Steam Cultivator. They are most useful implements, after the land has been broken up by the steam cultivator, and 15 to 20 acres a day may be done with them, much more effectually than by horse power.

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#### HOWARDS' APPARATUS ON THE DOUBLE ENGINE SYSTEM.

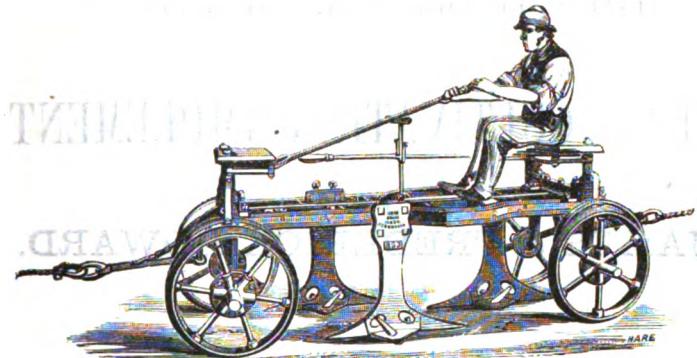
J. & F. HOWARD'S NEW PATENT ENGINES have been specially designed to meet the requirements of Steam Ploughing Companies and large occupiers, or for letting out on hire. They are, nevertheless, equally well adapted for general farm use, or for hauling heavy loads. The general arrangement of these Engines is as simple as possible, and their construction is such as to ensure durability. J. & F. Howard have been long convinced that in an Engine intended for ploughing, the Boiler should be so arranged as not to be subject to great variation in the water level, inasmuch as Ploughing Engines may for days together be working up or down steep inclines, causing great variation in the water level, with its consequent results.

These Engines are specially adapted for working on the Double Engine system. Where the fields are large and square, a greater breadth of land can be ploughed in a day by this arrangement than by any other, and less time is occupied in removing from field to field or place to place. They are equally well adapted for ploughing on the Single Engine system, being fitted with two winding drums conveniently arranged upon the framework; the whole apparatus can be thus conveyed from field to field without the aid of horses, and the time occupied in setting down is reduced to less than one-half, while the first cost is little more than that of an ordinary self-propelling Engine and a detached Windlass. When the Engine is required for the ordinary work of a farm, such as thrashing, grinding, &c., the power can be taken from the fly-wheel in the same manner as with ordinary portable Engines. The Engine is capable of hauling a load of 20 or 30 tons on a moderately good road, and it can ascend an incline of one foot in six with ease. From the successful working of these Engines, both for ploughing and traction purposes, J. & F. Howard have great confidence in recommending them.

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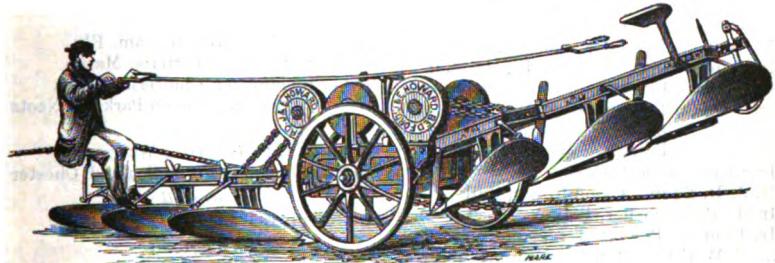
HOWARDS' STEAM CULTIVATING APPARATUS can be seen at work daily throughout the season, on their farms, one mile from Bedford Station, which can be reached in an hour by Midland Railway from King's Cross, London.

**HOWARDS' DOUBLE-ACTION STEAM CULTIVATOR.**



*For Description see page 6.*

**HOWARDS' DOUBLE-ACTION STEAM PLOUGH.**



*For Description see page 5.*

**HOWARDS' DOUBLE-ACTION STEAM HARROWS.**



*For Description see page 6.*

LIST OF PURCHASERS IN GREAT BRITAIN  
OF  
STEAM CULTIVATING IMPLEMENTS,  
MANUFACTURED BY  
JAMES & FREDERICK HOWARD.

HER MAJESTY THE QUEEN, OSBORNE, ISLE OF WIGHT.

*Bedfordshire.*

Mr. W. Ackroyd, Dean  
Mr. J. S. Crawley, Farley, Luton  
Mr. Henry Keep, Carlton  
Mr. William Lavender, Biddenham  
Mr. Robert Long, Standon, Biggleswade  
Mr. Thomas Brightman, Little Staughton  
Mr. William Pike, Stevington  
Mr. J. C. Robinson, Stevington  
Mr. Edward Turney, Souldrop  
Mr. Charles Street, Cople  
Mr. J. D. Squire, Clophill, Ampthill  
Mr. T. B. Kitchener, Potton  
Mr. Edmund Powers, Tempsford  
Rev. J. W. C. Campion, Westonning, Woburn  
Mr. G. Hawkes, Arlysey

*Berkshire.*

Mr. J. Walter, Bearwood Farm, Wokingham  
Mr. R. Benyon, M.P., Ufton, Reading  
Mr. E. Pullen, Sutton Courtney, Abingdon  
Mr. T. H. Simmons, Whitley, Reading  
Mr. William Bulstrode, Cookham Dean, Maidenhead  
Mr. J. Gillett, Highway Farm, Maidenhead  
Mr. W. Holmes, Wargrave, Reading  
Mr. James Williams, Shippon, Abingdon  
Mr. John Hargreaves, Silwood Park, Sunningdale  
Mr. E. Goodman, Oare, Pewsey

*Buckinghamshire.*

Baron de Rothschild, M.P., Mentmore, Tring  
Sir Anthony de Rothschild, Bart., Aston Clinton, Tring  
Mr. G. Baker, Loughton, Stony Stratford  
Mr. F. W. Bignell, Loughton  
Mr. Stephen Byers, Slapton, Tring  
Mr. J. Nickson, Loughton, Stony Stratford  
Mr. Thomas Revis, Olney  
Mr. Henry S. Trowers, Castlethorpe, Stony Stratford  
Mr. W. W. Thorne, Bishopstone, Aylesbury

*Cambridgeshire.*

Mr. William Fyson, Stuntney, Ely  
Mr. J. L. King, Wood Ditton, Newmarket  
Mr. Martin Pate, Ely  
Mr. Robert Pate, Haddenham, Ely  
Mr. A. S. Ruston, Chatteris, March  
Mr. T. Richardson, Chatteris, March  
Mr. G. O. Newton, Croxton Park, St. Neots

*Cheshire.*

Miss Edwards, Gib Hill, Warrington  
Mr. J. Cattle, Marsh Farm, Sealands, Chester

*Cornwall.*

Mr. Joseph Lyle, Bonython, Helston

*Cumberland.*

Messrs. Carr & Co., Carlisle  
Mr. Jenkinson, Cockermouth  
Mr. John Norman, High Close, Aspatria

*Dorsetshire.*

Mr. C. Hawkins, Alton Pancras, Dorchester  
Mr. H. Duke, Broad Mayne, Dorchester  
Mr. Miles Rodgett, Sandford, Wareham

*Essex.*

Messrs. Bott & Impey, Broomfield, Chelmsford  
Messrs. Blyth & Squier, Stanford-le-Hope, Romford  
Mr. Joseph Bray, Pyrgo Park, Romford  
Mr. W. Scragg, Gt. Clacton, Colchester  
Mr. Joseph Foster, Blunts Hall, Witham  
Mr. J. Neill, Canewden Hall, Rochford, Chelmsford  
Mr. C. W. Willsher, Petches Farm, Braintree

Mr. R. Hayden, Rickling's Green, Bishop Stortford

*Gloucestershire.*

The Right Hon. Lord Sudeley, Toddington, Cheltenham  
Dr. Hitch, Sandywell Park, Cheltenham  
Mr. Surman, Swindon Hall, Cheltenham  
Mr. H. Wilkins, Westbury-on-Severn  
Messrs. R. T. & J. Witcomb, Pirton Court, Churchdown, Gloucester  
Mr. T. Williams, Nass House, Lydney  
Mr. Brain, Greet, Winchcomb, Cheltenham

*Hampshire.*

Mr. G. Young, Apley Towers, Ryde  
 Mr. J. Lancashire, Micheldever  
 Mr. J. W. Scott, Rotherfield Park, Alton  
 Mr. W. H. Stone, Leigh Park, Havant  
 Mr. A. Rosling, Droxford, Southampton  
*Herefordshire.*  
 Mr. F. Drinkwater, Eaton Bishop, Hereford  
 Mr. Hawkins, Sugwas, Hereford  
 Mr. Thomas Davis, Linton, Ross  
 Mr. Felix Smith, Upton Bishop, Ross  
 Mr. Charles Brundson, Sutton, Hereford  
 Herefordshire Steam Cultivating Co.  
 (Limited), Hereford

*Hertfordshire.*

Mr. E. J. Davis, New Park Farm, Hertford  
 Mr. R. Nicholson, Much Hadham, Ware  
 Mr. John Smyth, Newsell's Bury, Royston  
 Mr. T. Willis Ginger, Kensworth, Dunstable

*Huntingdonshire.*

His Grace the Duke of Manchester, Kimbolton Castle  
 Colonel Linton, Buckden, Huntingdon  
 Messrs. Armstrong & Topham, Grafham  
 Mr. F. Battock, Hemingford Abbots  
 Mr. W. Cranfield, Buckden, Huntingdon  
 Mr. R. Faux, Yaxley Lodge, Peterborough  
 Mr. T. Inskip, Fenstanton, St. Ives  
 Mr. W. Looker, Wyton, Huntingdon  
 Mr. J. Rust, Alconbury, Huntingdon  
 Mr. R. Barton, Wigan Farm, St. Ives  
 Mr. J. Mortlock, Pidley, Huntingdon  
 Mr. R. Daintree, Woolley, Kimbolton  
*Kent.*

Mr. Davidson, Wateringbury, Maidstone  
 Mr. Punnett, Chart Sutton, Staplehurst  
 Mr. W. Gillow, Sandwich  
 Mr. J. Henderson, Shrubbery, Sandwich  
 Mr. Gascoyne, The Lawn, Sittingbourne  
 Mr. W. C. Morland, Lamberhurst  
 Mr. E. L. Betts, Aylesford Park, Maidstone  
 Mr. James Lake, Newlands, Sittingbourne  
 Mr. T. Piddesden, New Romney, Folkestone  
 Mr. John Abbott, Ospringe Parsonage, Faversham  
 Mr. L. Latter, Leigh, Tunbridge  
 Messrs. J. & F. Cheesman, Boughton Malherbe, Maidstone  
 Mr. Thomas Lake, Tong, Sittingbourne  
 Mr. Mansfield, Raynham, Sittingbourne  
 Messrs. Blaxland & Martin, Westwood Court, Faversham

*Lancashire.*

Messrs. J. & D. Harrocks, Greenbank Farm, Toxteth Park, Liverpool  
*Leicestershire.*  
 Lord A. St. Maur, Burton Hall, Loughboro'  
 Mr. Packe, M.P., Prestwold Farm, Loughborough  
 Mr. J. Broadhead, Twycross, Atherstone  
 Mr. J. Toone, High Cross, Lutterworth  
 Mr. G. E. Paget, Sutton Bonington, Loughborough  
 Mr. T. Wilson, Knaptoft Hall, Market Harborough

*Lincolnshire.*

Mr. T. B. Dring, Claxby, Spilsby  
 Mr. Dring, Sutton Marsh, Long Sutton  
 Mr. H. Hemsley, Harlaxton, Grantham  
 Mr. F. Sowerby, Aylesby, Grimsby  
 Mr. J. Sowerby, jun., Beelsby, Grimsby  
 Mr. L. Walker, Gedney Marsh, Long Sutton  
 Mr. B. Wass, Osgodby, Market Rasen  
 Mr. T. Howard, Winterton, Brigg  
 Mr. A. Partridge, Roxholme Hall, Sleaford  
 Messrs. J. & J. Monks, Belton Gorse, Grantham  
 Messrs. Marshall, Sons & Co., Gainsboro  
 Mr. John Brown, South Owersby, Market Rasen  
 Mr. Robert Cartwright, Owersby, Market Rasen  
 Mr. R. F. Ealand, Potter Hanworth, Lincoln  
 Mr. T. Trotter, Stones Place, Lincoln

*Middlesex.*

Mr. Joseph Moores, Ruislip, Uxbridge  
*Monmouthshire.*

Mr. H. Collins, Duffryn, Castleton, Cardiff  
*Norfolk.*

Mr. J. Walker, Terrington St. Clements  
 Mr. J. L. King, Thorpe Abbotts, Scole  
*Northamptonshire.*

Mr. M. Berkeley, King's Cliff, Wansford  
 Mr. T. F. Edwards, Tanholt, Eye  
 Mr. E. H. C. Monckton, Fineshade Abbey, Wansford  
 Mr. John W. Pell, Stanion, Thrapston  
 Mr. T. Sargeant, Brayfield-on-the-Green  
 Mr. T. Hatfield, St. Martin's, Stamford  
 Mr. S. Rooke, Harboro' Hill, Gretton  
 Mr. H. S. Stratford, Thorpe-by-Lubenham  
*Rugby.*

*Northumberland.*

Mr. S. Langdale, Morpeth  
*Nottinghamshire.*

His Grace the Duke of Portland, Welbeck Abbey, Worksop  
 Mr. John Hemsley, Shelton, Newark  
 Mr. D. Hardstaff, West Leake, Loughboro  
 Mr. Kenrick, Thurgarton Hill, Southwell  
 Messrs. D. New & Co., Nottingham  
 Mr. J. H. Fisher, Orston, Elton, Nottingham

*Oxfordshire.*

His Grace the Duke of Marlborough  
 Blenheim Palace, Woodstock  
 The Right Hon. Lord Dillon, Dytchley Park, Enstone  
 Mr. Samuel Druce, Eynsham, Oxford  
 Mr. Edward Griffin, Towcersey, Thame  
 Mr. R. Moores, Haddenham, Tetsworth  
 Mr. T. W. Tubb, Milcombe, Banbury  
 Mr. G. Billing, Great Haseley, Tetsworth  
 Mr. G. Gammie-Maitland, Shotover House, Oxford  
 Mr. W. Hensman, Huntercombe Manor, Nuffield  
 Mr. J. Deane, Newington, Wallingford  
 Mr. James Mason, Eynsham Hall, Witney

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*Shropshire.*

Mr. S. Brown, Brockton Hall, Shifnal  
 Mr. Charles Cooper, Hilton, Bridgenorth  
 Mr. Pullen, Shackerley, Wolverhampton  
 Mr. T. Nock, Sutton Maddock, Shifnal  
 Mr. J. E. Stanier, Uppington, Wellington  
 Market Drayton Steam Cultivation Co.  
 (Limited)

Whitechurch Steam Cultivation Co. (Limited)  
 A. R. Boughton-Knight, Esq., Downton  
 Castle, Ludlow  
 Tenbury Steam Cultivation Co. (Limited)

*Somersetshire.*

Mr. J. Carter, Pawlett, Bridgewater  
 Mr. Robert Hole, Stawell, Bridgewater  
 Mr. T. Hurman, Bawderip, Bridgewater  
 Mr. W. Morris, East Lydeard, Taunton  
 Mr. Taylor, East Quantoxhead  
 Mr. W. Webb, Curry Rivel, Taunton  
 Mr. J. H. Fry, Portfield, Langport

*Staffordshire.*

His Grace the Duke of Sutherland, Trentham  
 The Rt. Hon. Lord Hatherton, Teddesley,  
 Stafford  
 Marquis of Anglesey, Beaudesert, Rugeley  
 Mr. H. Stanley, Bloxwich, Walsall  
 Mr. John Darling, Beaudesert, Rugeley

*Suffolk.*

Sir F. Crossley, Bart., M.P., Somerleyton  
 Mr. E. Greene, M.P., Ixworth, Bury St.  
 Messrs. Garrett & Son, Leiston [Edmunds  
 Mr. A. C. King, Desning Hall, Gazeley  
 Mr. W. B. Chandler, Hacheston, Wickham  
 Market

*Surrey.*

Hon. P. J. Locke King, M.P., Brooklands,  
 Chertsey  
 Mr. John Bradshaw, Knowle, Guildford  
 Mr. Patrick Kerr, North Cheam, Epsom  
 Mr. W. Cousins, Nore, Godalming  
 Mr. T. L. Thurlow, Rudgwick, Horsham  
 Mr. Felix Champney, Gatwick, Crawley  
 Mr. C. Leney, Levers, East Peckham  
 Mr. W. Hipwell, Kingston-on-Thames  
 Mr. S. Bowman, Nag's Hall, Godstone

*Sussex.*

Rt. Hon. Lord Leconfield, Petworth House  
 Mr. W. Egerton Hubbard, St. Leonard's,  
 Horsham  
 Mr. Leyland Woods, Chilgrove, Chichester  
 Mr. J. H. Trouncer, M.D., Horeham Manor,  
 Hailsham [Shoreham  
 Messrs. J. & W. Hampton, Appleshaw,  
 Mr. W. W. Smith, Bolney, Cuckfield  
 Mr. G. Morgan, The Thorne, Sidley, Battle  
 Mr. M. Scarth, Lower Beeding, Horsham  
 Mr. John Bourne, Bugsell, Salehurst, Hurst  
 Green  
 Mr. G. Ashburner, Tilgate Lodge, Crawley

*Warwickshire.*

Mr. T. A. Bromwich, Wolstone, Coventry  
 Mr. P. Davis, Bickmarsh, Alcester  
 Mr. M. Phillips, Stratford-on-Avon  
 Mr. L. Terrell, Stockingford, Nuneaton  
 Mr. S. Shepheard, Eathorpe Hall, Leamington

Mr. John Ford, Morton Hall, Warwick  
 Mr. J. W. Pridmore, Coleshill, Birmingham  
 Mr. T. Garner, Wasperton Hill, Warwick  
 Mr. J. Hands, Wellesbourne, Warwick  
 Mr. S. B. Congreve, Harborough Magna  
 Mr. John Hicken, Bourton, Rugby

*Wiltshire.*

Mr. W. Moody, Boreham Farm, Warminster  
 Mr. J. Ormond, Ramsbury, Hungerford  
 Mr. J. B. Starky, Spye Park, Chippenham  
 Mr. T. P. Galpin, Little Langford, Heytesbury

*Worcestershire.*

Mr. C. Randall, Chadbury, Evesham  
 Mr. John Smith, Dumbleton, Evesham  
 Mr. William Holder, Eastham, Tenbury  
 Mr. B. Bomford, Pitchill, Evesham  
 Mr. H. Allsopp, Hindlip Hall, Worcester  
 Mr. John Higginbottom, Pensax Court,  
 Tenbury  
 Mr. W. Hiorns, Church Honeybourne,  
 Broadway

*Yorkshire.*

Mr. Thomas Coulson, Drax Hall, Selby  
 Mr. F. F. Robertson, Spaldington, Howden  
 Mr. P. Stevenson, Rainton, Thirsk  
 Mr. R. Emsley, Clayton, Knaresboro'

*Scotland.*

His Grace the Duke of Sutherland, Tarbat  
 Mains, Invergordon  
 Rt. Hon. Earl of Caithness, Barrogill Castle,  
 Thurso  
 Rt. Hon. Lord Kinnaird, Rossie Priory,  
 Inchture  
 Colonel Hay, Dunse Castle, Dunse  
 Mr. H. Houldsworth, Coltness, Motherwell  
 Mr. G. Hope, Fenton Barns, Drem

*Ireland.*

Right Hon. Lord Longford, Killucan  
 Mr. T. C. Trench, Millicent, Nass  
 Mr. J. N. S. Wallis, Drishane Castle, Mill-  
 street  
 Mr. W. Malcomson, Tramore

*Wales.*

Hon. H. H. Tracy, Gregynog Hall, Newtown  
 Mr. R. N. Hooper, Cowbridge  
 Mr. V. Gosford, Tan-y-lan, Holywell  
 Mr. J. Surridge, Cogan Hall, Cardiff

In addition to the above, J. & F. HOWARD have supplied large quantities of STEAM CULTIVATING MACHINERY to France, Belgium, Germany, Italy, Spain, Portugal, Greece, Egypt, India, America, West Indies, Australia, New Zealand, and other parts of the world.

For full particulars, and Reports from Purchasers, see J. & F. HOWARD'S STEAM PLOUGH CATALOGUE, sent Post-free on application.

# HOWARDS' CHAMPION PLOUGHHS.

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SIXTY-FIVE THOUSAND ARE IN USE.

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J. & F. HOWARD direct special attention to their New Patent Champion Ploughs, which are improved forms of their original Prize Ploughs. They have been brought out with the greatest care, and after long and protracted experiments: the object sought being to combine the advantages of "high-cutting" ploughs, which lay the furrows at an acute angle, with those of the rectangular, or "low cutting" ploughs. Every improvement has been adopted which has suggested itself during a long experience in the manufacture of Iron Ploughs, and J. & F. Howard believe their New PLOUGHHS to be far superior for general purposes to any ploughs yet produced.

The improvements consist in a more perfect form of the moving and cutting parts, increased simplicity, and greater strength, with less weight.

For many years J. & F. Howard have made the subject of improvements in Ploughs their principal study, and they have invariably kept in view the following objects:—

1. To make a plough that will cut and turn the work in the best manner, and suitable to the greatest variety of soil.
2. To obtain a form, the lightest in draught, and that will work the cleanest on sticky soils.
3. To substitute wrought iron or steel for cast iron, wherever desirable, so as to render every part strong and durable, without unnecessary weight.
4. To make every part free from complication, and to fit those parts subject to wear or breakage in the most simple manner, so that an ordinary ploughman shall have no difficulty in replacing them when in the field.
5. To make the plough that can be kept in order at the least expense; to which end J. & F. Howard have paid great attention to the quality of their shares and other wearing parts.

For some years past they have made a number of experiments with various kinds of iron, with a view to test the strength and wearing qualities of the same; believing that unless they produced better castings than local founders, they could not expect to supply those who live at a great distance from their manufactory.

To ensure perfect accuracy, J. & F. Howard have constructed patented machines for the production of their Plough Castings, by which means the trouble and delay, so often caused by wearing parts fitting imperfectly, are entirely avoided.

## HOWARDS' PATENT CHILLED SHARES,

Hardened by a process for which J. & F. Howard have obtained Her Majesty's Royal Letters Patent, will be found to WEAR SHARPER AND LAST LONGER than any shares produced by any other process ever yet discovered. They are of greater uniformity of temper, and are also cast cleaner and thinner on the cutting edge than those made by the usual process.

The *wrought iron* used in the construction of J. & F. Howard's Implements is also of the best and most expensive description.

## HOWARDS' PATENT CHAMPION PLOUGHS

Are made principally of wrought iron, and are as light as they can be made consistently with durability.

THE BEAMS are ribbed or flanged at the hinder part, which gives great strength where most liable to strain: this method is patented by J. & F. Howard.

THE HANDLES and beams are made throughout in a piece, which effectually prevents their shaking loose, and also the accumulation of soil in the hinder part of the plough.

THE FRAME or BODY, into which the lever neck is fitted, is formed so as to stand the roughest usage, and the lever neck is so boxed in as not to be liable to wear or breakage.

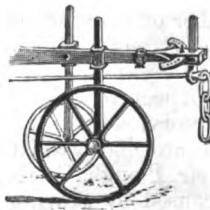
THE SOCKET OF THE SHARE is made plain on the under side, which not only effectually prevents its bursting, but causes the plough to run smoothly on its sole.

THE SHARES are fixed to lever necks of wrought iron, made upon an improved and patented principle, the raising or lowering of which gives the point greater or less *pitch* or inclination, as the share wears, or as the state of the land may require. The superiority of this lever neck over others consists in its being tightened at the end, instead of by a bolt through the side; and when raised or lowered, which can be done instantly, it is firmly secured in a series of grooves. The accumulation of earth inside the plough in most instances renders a lever useless, as it cannot be moved without a great deal of trouble; but in this arrangement, by simply taking off the end nut, it may be at once disconnected from the plough, and anything preventing its free action removed.

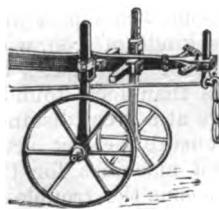
THE WHEELS are fixed to the beam in the following manner:—

In each plan strong screws are used, and are made so as to stand a great amount of wear.

No 1, Wheel Fastenings.



No. 2, Wheel Fastenings.



In the No. 1 the furrow wheel is expanded by a sliding axle. It is a very simple and secure plan, and rather lighter than No. 2.

In the No. 2 plan the land wheel is made to expand as well as the furrow wheel, by slides through the beam. Ploughs run more steadily when thus fitted.

THE WHEELS are capped both behind and in front; this prevents grit getting to the axles, and grease from escaping; the wheels also wear much longer, the axles require less repairing, and the friction is likewise considerably reduced.

THE BREASTS are made upon exact geometrical principles; consequently they work clean on adhesive soil, and the power required is considerably lessened; the furrows are also laid in the best form for the reception of the seed.

THE COULTER is fastened by a wrought-iron clip; it is strong and simple, can be adjusted instantly, and, being made to slide on the beam, the angle of the coulter can be altered as required.

THE DRAUGHT CHAIN is also of great advantage, as it removes all strain from the beam; the line of draught is also more direct, and consequently the power required is less.

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SOME OF THE ADVANTAGES OF  
HOWARDS' NEW CHAMPION PLOUGHS.

1. The BEAMS are *ribbed* or flanged at the hinder part, which gives great strength where most required, and effectually prevents springing or bending.
2. The FRAME or body, to which the lever neck is fitted, will not spring in hard work, and is formed so as to stand the roughest usage.
3. The BODY can be removed from the beam, and a Sub-soil or Ridging body attached.
4. The BREASTS are formed so as to go clean on the most adhesive soil.
5. The LEVER NECK is so boxed in as not to be liable either to wear or breakage.
6. The LEVER NECK is tightened at the end, so that the objection to a lever neck becoming loose through wear is entirely avoided.
7. The WHEEL FASTENINGS are most simple, and being made to tighten in the direction of the strain, are not liable to get loose through wear.

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In the general arrangement of ploughs, J. & F. Howard have uniformly aimed at simplicity: and in this respect, as well as lightness of draught, they believe their Champion Ploughs will be found

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THE BEST YET PRODUCED.

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ALL PLOUGHS Manufactured by J. and F. HOWARD are branded "HOWARD, NEW PATENT," on the top of the beam; and as others purporting to be theirs are often offered for sale, they caution the public against purchasing any not branded in this manner.

HOWARDS' CHAMPION PLOUGHES  
HAVE WON IN LESS THAN THREE YEARS  
SIXTY-EIGHT ALL ENGLAND PRIZES,  
AND UPWARDS OF  
FIFTEEN HUNDRED LOCAL PRIZES,  
BY FAR THE LARGEST NUMBER EVER AWARDED TO ANY KIND  
OF PLOUGH.

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THE FOLLOWING PRIZES  
HAVE ALSO BEEN AWARDED TO  
JAMES & FREDERICK HOWARD,  
BESIDES MANY OTHERS BY  
ENGLISH, SCOTCH, IRISH, CONTINENTAL, COLONIAL,  
AND OTHER SOCIETIES.

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BY THE  
ROYAL AGRICULTURAL SOCIETY  
OF ENGLAND,  
FORTY-FOUR FIRST PRIZES  
FOR THE  
BEST PLOUGHES FOR LIGHT LAND,  
BEST PLOUGHES FOR HEAVY LAND,  
BEST PLOUGHES FOR GENERAL PURPOSES,  
BEST RIDGING PLOUGHES, BEST SUBSOIL PLOUGHES, BEST HARROWS,  
BEST STEAM HARROWS,  
BEST HORSE RAKES, BEST HAYMAKERS,  
AND BEST HORSE HOES;  
ALSO THE  
GOLD MEDAL, AND OTHER PRIZES,  
FOR STEAM CULTIVATING MACHINERY.

GREAT EXHIBITION OF ALL NATIONS, 1851.  
THE PRIZE MEDAL FOR PLOUGHES AND HORSE RAKES.

PARIS UNIVERSAL EXHIBITION, 1855.  
THE GOLD MEDAL OF HONOUR FOR THE BEST PLOUGHES,  
BEST HARROWS, AND BEST HORSE RAKES.

PARIS AGRICULTURAL EXHIBITION, 1856.  
SEVEN FIRST PRIZES, AND EIGHT GOLD AND SILVER MEDALS  
FOR THE BEST PLOUGHES, BEST HARROWS, AND BEST HORSE RAKES.

AUSTRIAN INTERNATIONAL EXHIBITION, 1857.  
THE GOLD MEDAL OF HONOUR FOR THE BEST PLOUGHES.

HUNGARIAN INTERNATIONAL EXHIBITION, 1857.  
THE FIRST CLASS DIPLOMA FOR THE BEST PLOUGHES.

INTERNATIONAL EXHIBITION, 1862.  
THE PRIZE MEDAL FOR PLOUGHES, HARROWS, HORSE RAKES,  
HAYMAKERS, AND STEAM CULTIVATING APPARATUS.

HAMBURGH INTERNATIONAL EXHIBITION, 1863.  
THE GOLD MEDAL FOR THE BEST PLOUGHES, BEST HARROWS,  
AND BEST HAYMAKERS, AND  
A PRIZE OF FORTY GUINEAS FOR STEAM CULTIVATING APPARATUS.

RUSSIAN INTERNATIONAL EXHIBITION, 1864.  
THE LARGE GOLD MEDAL FOR THE BEST PLOUGH.

FRENCH INTERNATIONAL STEAM PLOUGHING  
MATCHES AT ROANNE AND MELUN, 1864.  
BOTH FIRST PRIZES OF £100 AND £60, AND BOTH GOLD MEDALS  
FOR STEAM CULTIVATING AND PLOUGHING APPARATUS.

PRUSSIAN INTERNATIONAL EXHIBITION, 1865.  
THE PRIZE MEDAL FOR THE BEST PLOUGHES AND HARROWS.

DANISH INTERNATIONAL EXHIBITION, 1866.  
THE PRIZE MEDAL FOR THE BEST PLOUGHES AND HORSE RAKES.

## HOWARDS' CHAMPION PLOUGHS.

The following Judges' Reports on Ploughs have appeared in the *Journal of the Royal Agricultural Society of England* :—

### FIRST MEETING of the SOCIETY, HELD at OXFORD, 1839.

“The plough exhibited by Messrs. HOWARD, of Bedford, of small size, with a mouldboard or furrow turner of excellent form, calculated to give the least resistance in turning over the furrow, was much approved.”

### BRISTOL MEETING.

“With regard to the excellence of the work done by the ploughs, as well as the lightness of draught, the palm of merit is unquestionably due to Messrs. HOWARD's two-wheeled implement: the furrow bottom being left cleaner and flatter, the slice better turned and placed, and the depth more evenly maintained, than by any other of the competing ploughs. The dynamometer not only proved this plough to draw four stones lighter than any other, but also that it exhibited a peculiar steadiness of movement and uniformity of draught. The average draught of ploughs tried was  $3\frac{1}{2}$  stones, whilst the draught of Messrs. HOWARD's iron plough was but 22 stones, all ploughing six inches deep and nine inches wide, being upon the average nearly one-third less.”

### DERBY MEETING.

“Messrs. HOWARD, of Bedford, again produced their wheel ploughs, so much admired and rewarded at the Bristol Meeting, and which appeared from their action to have lost nothing of their excellence.”

### SHREWSBURY MEETING.

“The dynamometers of Mr. Clyburn and Mr. Bentall were both used at this meeting, and it appeared from each of them that Messrs. HOWARD's plough took the least draught as well as made the best work: a result quite consistent with the experiments previously made at the Society's trials.”

### SOUTHAMPTON MEETING.

“Some very good work was done on the light as well as on the stiff soil by Messrs. HOWARD's ploughs.”

### NEWCASTLE-ON-TYNE MEETING.

“Ploughing was first commenced on the light land, seventeen implements having been selected for competition, some of which were furnished with two wheels, some with one wheel, and some worked without a wheel or as swings; each plough being set to complete a land, without the interference of any party on the spot until the whole performance was complete. The manifestation of superiority in favour of the two-wheel plough made by Messrs. HOWARD, of Bedford, was unquestionable, and in all the respects which would guide the judgment of a competent farmer in his choice of this important implement. The sole of the furrow was cut perfectly flat, the land side clean and true, the furrow slices were laid with perfect uniformity throughout the field, and in a beautiful position for receiving the seed; the judges therefore awarded the first prize of £10 to Messrs. HOWARD.

“Fourteen ploughs operated upon the heavy land, and nearly similar distinctive characteristics were appreciated in the results; the judges again awarding the first prize of £10 to Messrs. HOWARD.

“The judges consider that all parties have much lee way to fetch up before their implements can equal the work done by Messrs. HOWARD's ploughs; indeed they are of opinion that no plough exhibited on this occasion possessed the power of construction to move soil to equal depth and with the same precision as Messrs. HOWARD's implements.”

### NORTHAMPTON MEETING.

“For the trial of ploughs on light land twenty-two were selected, and the prize awarded to Messrs. HOWARD: the judges being quite satisfied with the numerous and excellent qualities of their plough, which they considered did great credit to its makers.

“Messrs. HOWARD's plough was the same as that exhibited by them last year, at Newcastle, when the two first prizes were awarded to it, the judges having found it the best implement both on light and heavy land.”

### YORK MEETING.

“The ploughs tried were twenty-three in number. The trial took place on a clover-ley of excellent quality for testing the good and bad properties of ploughs. We decided that Messrs. HOWARD's plough was the best. We considered the furrow turner pretty near perfection, and calculated to plough any description of land that a plough can do. We had no hesitation, therefore, even amongst this numerous and excellent class, in deciding in favour of this plough.”

### NORWICH MEETING.

“The land upon which the ploughs were tried was of a hard and stubborn character, and we awarded the prize to Messrs. HOWARD's 'Champion Plough.'”

## EXETER MEETING.

"The trial ground was exceedingly favourable, of a strong loamy clay. In this class thirteen ploughs were set to work, with instructions to turn a furrow slice of not less than nine inches in depth, leaving the width to the discretion of the exhibitors; after a few rounds, the plough by Messrs. HOWARD, of Bedford, showed itself to be superior, not only in turning the furrow slice in a complete and satisfactory manner, but in placing it in a proper position (as before mentioned), cutting out the furrow square, clean, and perfectly level."

## LEWES MEETING.

"A new feature in Messrs. HOWARD's ploughs deservedly obtained the Society's Medal. The improvement consisted in making the box or nave of the wheels so as to preclude the possibility of dust, soil, &c., being cast on the spindle; thus obviating a defect so commonly observed, viz., that the wheels, if even constantly oiled, are ground untrue."

## GLOUCESTER MEETING.

"*Ploughs for general purposes.*—Among the number sent out for trial, the superiority of that class with which Messrs. HOWARD's name has been so long connected was soon evident."

## LINCOLN MEETING.

"*Deep Ploughing.*—Six ploughs competed in this class, four of which were soon seen to be incapable of standing the severe test to which they were subjected; the remaining two performed their work well, and, notwithstanding their being put to the severest test by eight selected horses, they both passed steadily through the work, making a fair and tolerable furrow, ten inches deep, on an almost impervious clay soil. Subsequently they were tested on a milder portion of the field at a less depth with four horses, and the work done by Messrs. HOWARD's plough appeared to us not only the cleanest cut, but the most effectually turned and laid up, less earth falling back into the furrow, and a somewhat broader furrow sole also being left; consequently we awarded the prize to Messrs. HOWARD."

## CHELMSFORD MEETING.

"*Ploughs for general purposes.*—Two series of experiments were made in this class; first, on rather a light loamy soil, and, next, on soil naturally strong (but rendered stronger by the treading of stock), and unusually hard from the dryness of the weather. In the light land, the work done by Messrs. HOWARD's plough, in particular, exhibited a marked superiority; it was, however, in the strong land that the capabilities of the several implements were worthily tested; and none but ploughs of the best construction had the smallest chance of success. The merits of several ploughs appeared at times pretty evenly balanced, yet the performance of Messrs. HOWARD's plough was upon the whole such as clearly to entitle it to be placed the first in this class; the first prize was therefore awarded to Messrs. HOWARD.

"*Ploughs best adapted for heavy land.*—This trial was upon a field of seeds pastured, on a strong heavy soil, very hard and dry, and in which none but the best ploughs could possibly work. The conditions were that the furrows should be eight inches deep by ten inches wide, the turf to be pared and deposited under the furrow. Notwithstanding the unfavourable condition of the ground, the furrows were cut with great cleanliness and regularity, the turf was pared, turned, and deposited with facility and completeness, and the result of this trial afforded a striking proof how ample and complete is the control which our best constructed ploughs now give over the most stubborn soils in the country. The judges awarded the first prize to Messrs. HOWARD.

"*Ploughs best adapted to light land.*—These were tried upon a field of light loamy soil, in most favourable condition for exhibiting excellence of work. The superior work of Messrs. HOWARD's plough, combined with its lightness of draught, induced the judges to award to them the first prize."

## WARWICK MEETING.

"*The general purpose ploughs*, perhaps the most useful under trial, stood the heavy land traction with good effect, and firmly met the resistance offered. The first prize was awarded to Messrs. HOWARD's H H plough."

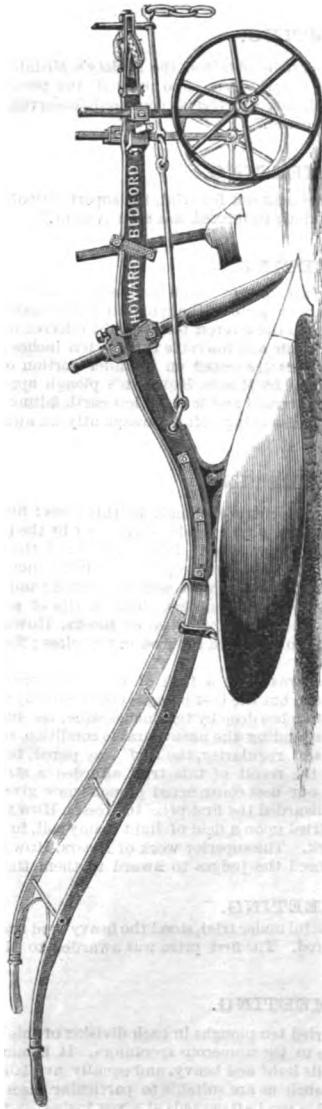
## NEWCASTLE MEETING.

"*General purpose ploughs.*—*Wheel ploughs.*—We tried ten ploughs in each division of this class, which, as might be anticipated, was most attractive to the numerous spectators. It is manifest that an implement capable of economical work in soils light and heavy, and equally available for shallow or deep work, will be more sought for than such as are suitable to particular cases only. We tried these ploughs at two depths, first at five inches, and afterwards at seven inches, and such was the condition of the soil that it was quite sufficient work for two powerful horses to draw the implement at the latter depth."

The first and only Prize was awarded to J. and F. HOWARD.

The above is the last Report issued by the Society.

HOWARDS, PATENT IRON PLOUGH MARKED B.



HOWARDS' CHAMPION PLOUGH has received FIFTEEN FIRST PRIZES from the Royal Agricultural Society of England, being much the largest number of PRIZES awarded to any kind of Plough ever exhibited.

HOWARDS' CHAMPION PLOUGHES have won in less than three years SIXTY-EIGHT ALL ENGLAND PRIZES, and upwards of FIFTEEN HUNDRED LOCAL PRIZES; by far the largest number ever awarded to any kind of Plough,

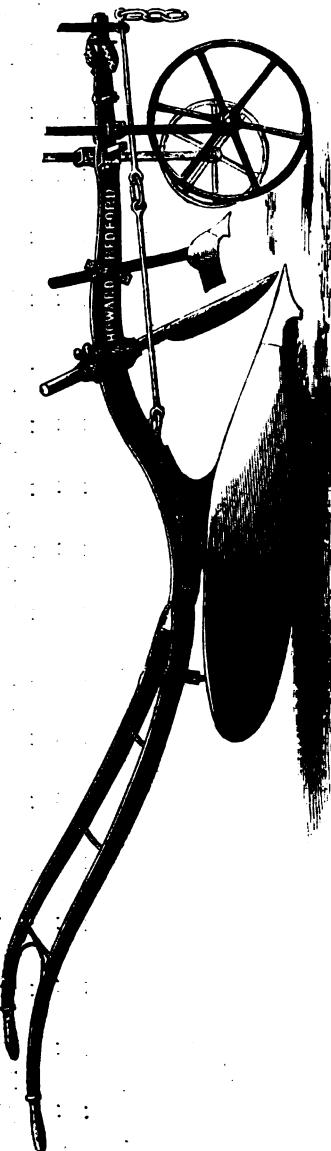
This Plough is an improved form of J. & F. Howard's original Prize Plough, and has been brought out with the greatest care, and after long and protracted experiments ; the object sought being to combine the advantages of "high cutting" ploughs, which lay the furrows at an acute angle, with those of the rectangular, or "low cutting" ploughs. Short breasts can be had, if preferred. A great advantage of the Ploughs marked B and B B is, that with them all the various processes of ordinary ploughing, paring, ridging, subsoiling, and potato raising can be performed by one implement, and to effect the necessary changes of bodies

This Plough is suitable for both light and heavy land ; and while light enough for two horses, is strong enough for four, and is recommended as the most generally useful two-horse plough.

Price	Skim coulter	Drag chain	If fitted with Steel Breast, highly recommended, especially for adhesive soil. 7s. 6d. extra. Steel side cap, 2s. 6d. extra.	£ s. d.
..	..	..	..	4 12 6
..	..	..	..	0 5 0
..	..	..	..	0 2 0

The average weight of this plough is 2*i* cwt.

## HOWARD'S PATENT IRON PLOUGH, MARKED B B.



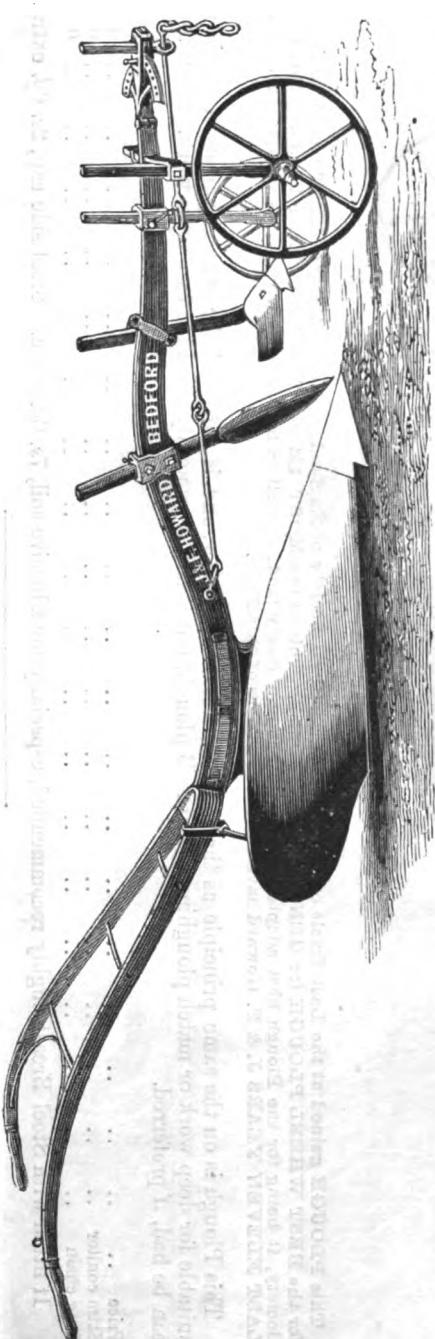
This PLOUGH gained at the Last Trials of the Royal Agricultural Society of England, at Newcastle, the FIRST and ONLY PRIZE for the BEST WHEEL PLOUGH for GENERAL PURPOSES. This is the MOST IMPORTANT PRIZE for Ploughs offered by the Society, it being for the Plough best adapted for both light and heavy land, as well as for the best work at various depths. For the LAST ELEVEN YEARS J. & F. Howard have been the winners of this Prize.

This Plough is on the same principle as the above, but is a size larger, and is intended for general purposes. It is more suitable for deep work or match ploughing than the B plough, but is not so generally liked for two-horse work. Short breasts can be had, if preferred.

	Price	£	s.	d.
Skin coulter	..	..	..	..
Drag chain	..	..	..	..
If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.				
Steel side cap, 2s. 6d. extra.				

The average weight of this plough is 2*1*/<sub>2</sub> cwt.

HOWARD'S PATENT IRON PLough, MARKED B B B.

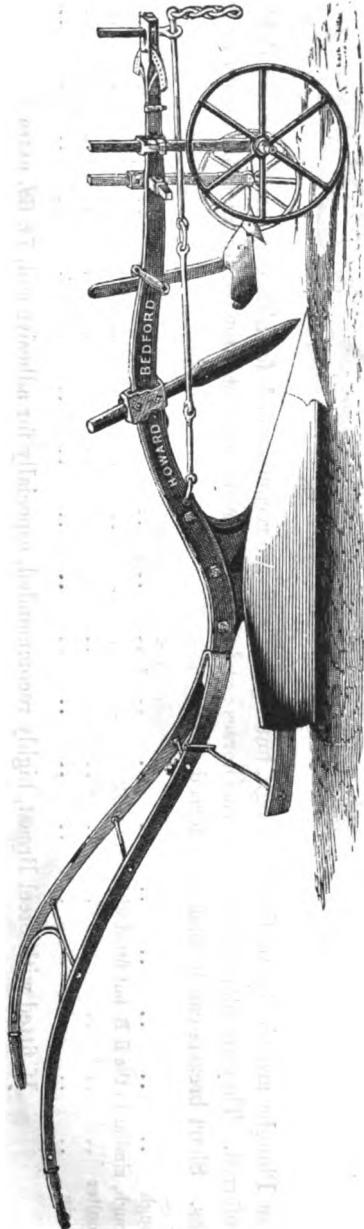


This Plough is on the same principle as the B B plough, but much larger, and is intended only for extra deep or *trench* ploughing with four or six horses. Every part is made very strong, so as to resist large stones or roots, and it will be found well adapted for Colonial purposes where new land has to be brought into cultivation. It may also be fitted with a breast for ploughing out two deep furrows previous to draining.

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 15s. extra. Steel side cap, 5s. extra.

The average weight of this plough is 3½ cwt.

## HOWARD'S PATENT IRON KENT PLOUGH S.

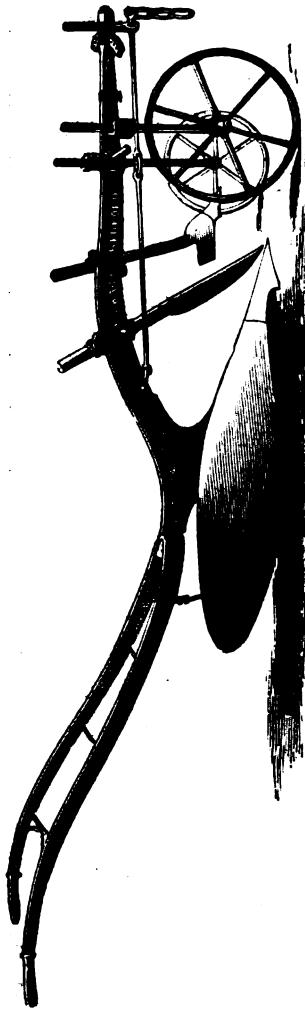


These Ploughs differ from J. & F. Howard's ordinary ploughs, inasmuch as they are constructed to turn the furrow completely over, or *upside down*; as by the old Kentish turn-rest, which they are superseding in some parts of that and the adjoining counties. The saving in horse power is considerable; one, and in many cases, two horses may be dispensed with.

	£	s.	d.
Price of a pair horse plough, complete as above, average weight 2 <i>1</i> / <i>2</i> cwt...	..	..	..
Price of a similar plough, but for four horses, average weight 3 <i>1</i> / <i>2</i> cwt. ..	..	..	..
Price of a similar plough, but for four horses, average weight 3 <i>1</i> / <i>2</i> cwt. ..	..	..	..

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7*s.* 6*d.* extra. Steel side cap, 2*s.* 6*d.* and 4*s.* extra.

## HOWARDS' PATENT IRON PLOUGHS, MARKED S B and L B.

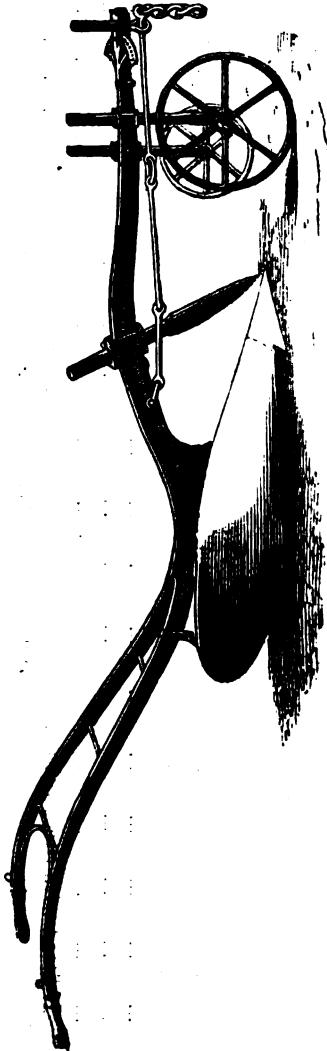


These Ploughs are similar to the B plough, but lighter, and are recommended for hilly countries, or where light ploughs are preferred. They are adapted for one or two horses; and although strong, are not intended for such hard work as the larger ploughs. Short breasts can be had, if preferred.

	£	s.	d.
S B plough	..	..	..
L B plough, similar to the S B, but fitted with lever neck	..	..	..
Skim coulter	..	..	..
Drag chain	..	..	..
If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.			
Steel side cap, 2s. 6d. extra.			

The average weight of these ploughs is  $2\frac{1}{4}$  cwt.

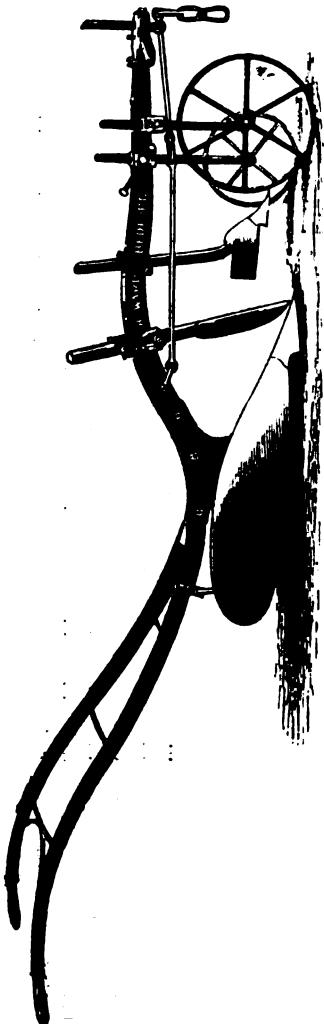
## HOWARD'S PATENT IRON COLONIAL PLOUGHS.



These Ploughs are made of various sizes, and are in every respect the same as those already described, except that the Frames or Bodies are made by a Patented process, by which cast iron is annealed and thus converted into malleable iron. This Patent Malleable Iron has the advantage of being as tough as wrought iron, and as stiff as cast iron, and for J. & F. Howard's celebrated Steam Ploughs and Cultivators is found to stand much better than the ordinary wrought iron. The handles and beams of these Ploughs take to pieces, for the convenience of packing in a small compass to save freight.

	£	s.	d.
S B colonial plough, average weight 2 cwt.	...	...	...
L B colonial plough, average weight 2½ cwt.	...	...	...
B colonial plough, average weight 2½ cwt.	...	...	...
B B colonial plough, average weight 2½ cwt.	...	...	...
B B B colonial plough, average weight 3½ cwt.	...	...	...
J P colonial plough, similar to the S B, but made to work with a share of the P pattern	...	...	...
Steel side cap, S B, L B, B, and B B, 6d., and B B B, 5d. extra.	...	...	...
If fitted with Steel Breast, highly recommended, especially for adhesive soil, S B, L B, B, and B B, 7s. 6d., and B B B 15s. extra.	...	...	...
Almost any of J. & F. Howard's ordinary Ploughs can be had with the Patent Malleable Iron Frames for 7s. 6d. extra.	...	...	...

HOWARDS' PATENT IRON PLOUGH. MARKED P.

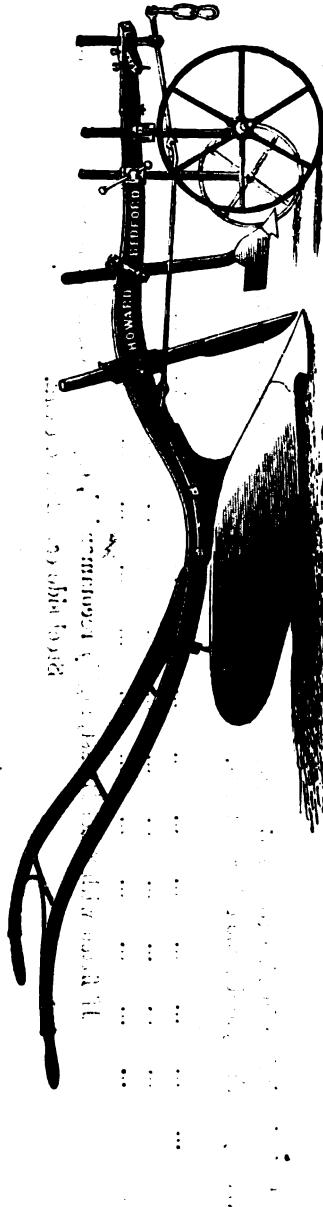


This Plough gained the FIRST PRIZE, as the BEST PLOUGH FOR LIGHT LAND, at the Chelmsford Meeting of the Royal Agricultural Society of England.

This Plough differs only from the more recent Plough marked B, in the principle of the breast and share, the furrows being cut by the P and P P ploughs of rectangular shape, and turned by the breast quicker or more abruptly. This plough is still in high repute in many parts of England.

The average weight of this plough is 2½ cwt.

## HOWARDS' PATENT IRON PLOUGH, MARKED P P.



This Plough gained the **FIRST PRIZE**, as the **BEST PLOUGH** for **GENERAL PURPOSES**, at the Chelmsford Meeting of the Royal Agricultural Society of England.

This Plough differs only from the more recent Plough marked B B, in the principle of the breast and share, the furrow being cut by the P and P ploughs of rectangular shape, and turned by the breast quicker or more abruptly. This plough is still in high repute in many parts of England.

	Price	s.	d.
Skin coulter	...	...	...
Drag chain	...	...	...
Steel side cap	2s. 6d.	extra.	

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.

Steel side cap, 2s. 6d. extra.

The average weight of this plough is  $2\frac{1}{4}$  cwt.

HOWARDS, PATENT IRON PLOUGH, MARKED T.



This is similar in size to the B plough, but is constructed so as to produce the narrow, high crested work preferred in Wales, Scotland, and some other districts.

	Price	Shim coulter	Drag chain	If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.	Steel side can, 2s. 6d. extra.
Price	...	...	...	...	...
Shim coulter	...	...	...	...	...
Drag chain	...	...	...	...	...

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.

Steel side cap, 2s. 6d. extra.

The average weight of this plough is 2*1*/<sub>2</sub> cwt.

HOWARD'S PATENT IRON PLOUGHS WITH ONE WHEEL.



These Ploughs are the same as J. & F. Howard's ordinary wheel ploughs, but fitted with the land wheel only.

	£	s.	d.
S B plough	...	...	...
L B plough	...	...	...
B plough	...	...	...
B B plough	...	...	...
Skin coulter	...	...	...
Drag chain	...	...	...

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.  
Steel side cap, 2s. 6d. extra.

The average weight of these ploughs is 2 cwt.

## HOWARD'S PATENT IRON SWING PLOUGHS.



These Ploughs are the same as J. & F. Howard's ordinary wheel ploughs, but are made with longer handles and shorter beams. They are the best and most efficient swing ploughs they have yet produced.

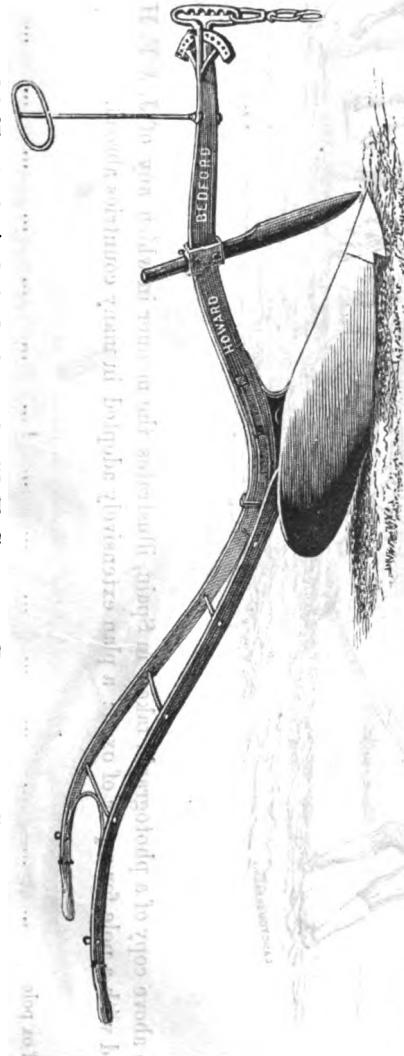
		£	s.	d.
S B	swing plough	...	...	...
L B	swing plough	...	...	...
B or T	swing plough	...	...	...
B B	swing plough	...	...	...
Slide foot to regulate the depth	...	...	...	...
Shim coulter	...	...	...	...
Drag chain	...	...	...	...

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra.

Steel side cap, 2s. 6d. extra.

The average weight of these ploughs is 2 cwt.

HOWARD'S PATENT ESSE PLONGH, MARKED SIX.



These Ploughs are similar to J. & F. Howard's Champion Plough, but adapted to work on the narrow *stitches* or *ridges* so generally adopted in the counties of Essex and Suffolk. They are light, strong, durable, and of easy draught. The shares are case-hardened, and therefore very durable; they can be put on or taken off instantly, and set with more or less **pitch**; no bolt, pin, or pad is required to fasten them. The socket of the share is made perfectly flat and smooth on the **under side**, which prevents the shares bursting, and causes the plough to run evenly on its sole. The coulter can instantly be **set in any position** without wedges, so that no time is lost. Every part is easily renewed, and all the fittings are free from complication.

	£	s.	d.
Price, without wheels...	...	...	...
Price, with one wheel...	...	...	...
Price, with two wheels...	...	...	...

Skim cultor, 5s. Drag chain, 2s. If fitted with Steel Breast, highly recommended, especially for adhesive soil, 7s. 6d. extra. Steel side cap, 2s. 6d. extra.

The average weight of this plough, fitted as above, is 2 cwt.

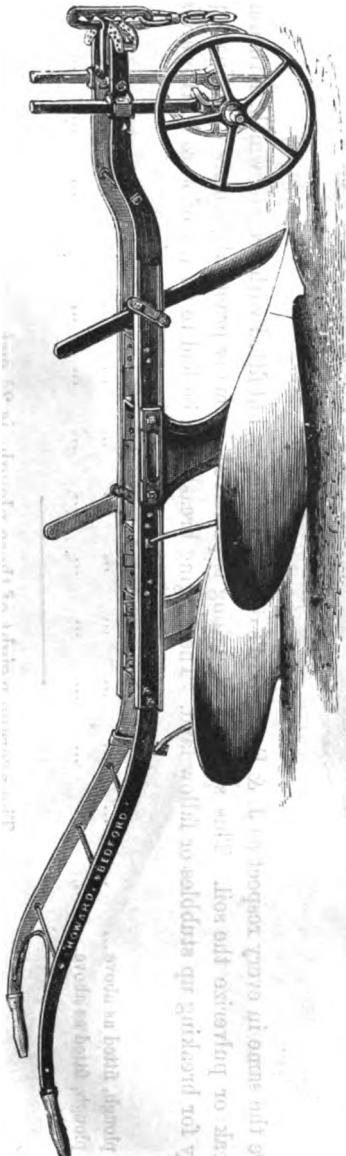
HOWARDS' PATENT IRON PLOUGH WITH OX POLE.



The above copy of a photograph, taken in Spain, illustrates the manner in which any of J. & F. Howard's Ploughs can be worked with a pole for a pair of oxen: a plan extensively adopted in many countries abroad.

Price of ox pole

## HOWARDS' PATENT IRON DOUBLE-FURROW PLOUGHS.



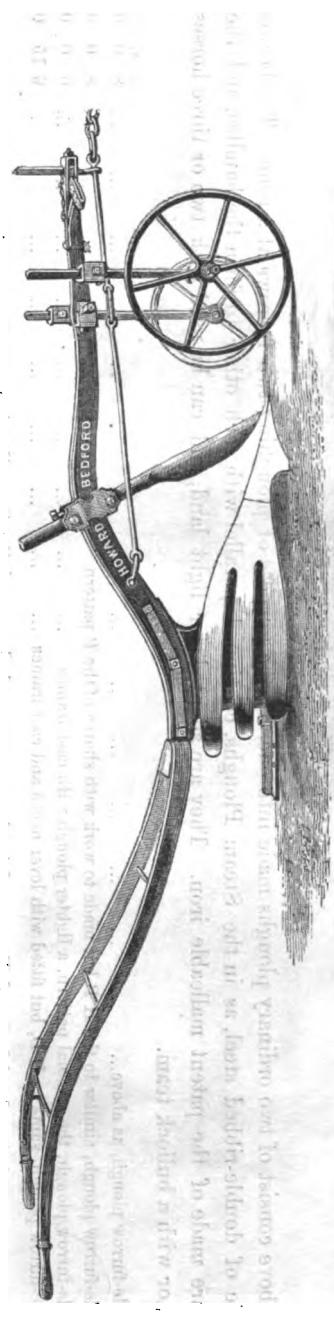
The above consist of two ordinary ploughs made into one, for the purpose of ploughing two furrows at a time. The beams are made of double-ribbed steel, as in the Steam Ploughs, continued parallel with each other to form the handles, and the frames are made of the patent malleable iron. They are adapted for light land, and can be used with two or three horses abreast, or with a bullock team.

	£	s.	d.
H B double-furrow plough, as above...	...	...	...
D P double-furrow plough, similar to the H B but made to work with shares of the P pattern	...	...	...
D D double-furrow plough, the original pattern, a lighter plough with cast frames	...	...	...
P D double-furrow plough, same as D D, but fitted with lever necks and cast frames	...	...	...

If fitted with Steel Breasts, highly recommended, especially for adhesive soil, 10*g.* extra.

The average weight of these ploughs is 8 cwt.

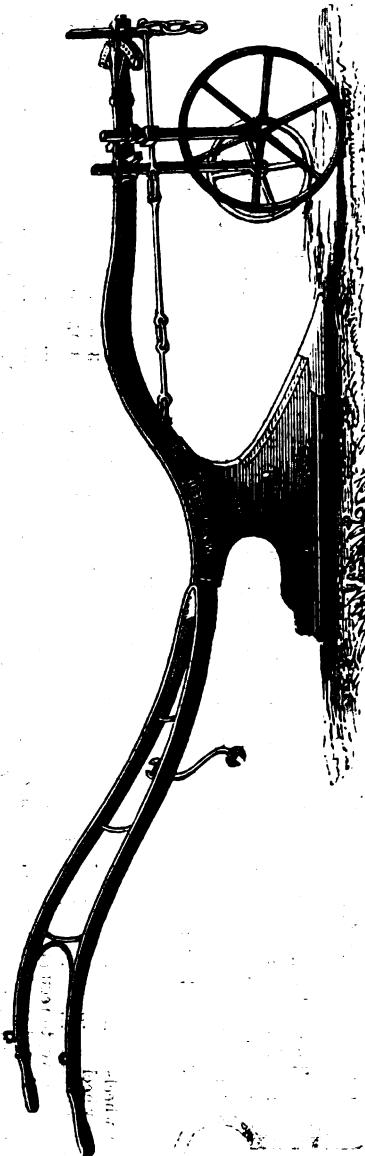
HOWARDS' IMPROVED PATENT IRON DIGGING PLOUGHS.



These are the same in every respect as J. & F. Howard's ordinary Ploughs, but fitted with breasts, which, in turning over the furrow, break or pulverize the soil. This style of ploughing is preferred by many practical farmers to ordinary ploughing, particularly for breaking up stubbles or fallow land. The digging breasts can be had to fit any of J. & F. Howard's Ploughs.

The average weight of these ploughs is  $2\frac{1}{4}$  cwt.

HOWARD'S, PATENT IRON SUGG'S OIL PLOUGH.



J. J. & F. H. Howard have received THREE FIRST PRIZES from the Royal Agricultural Society of England for the Best Subsoil Plough.

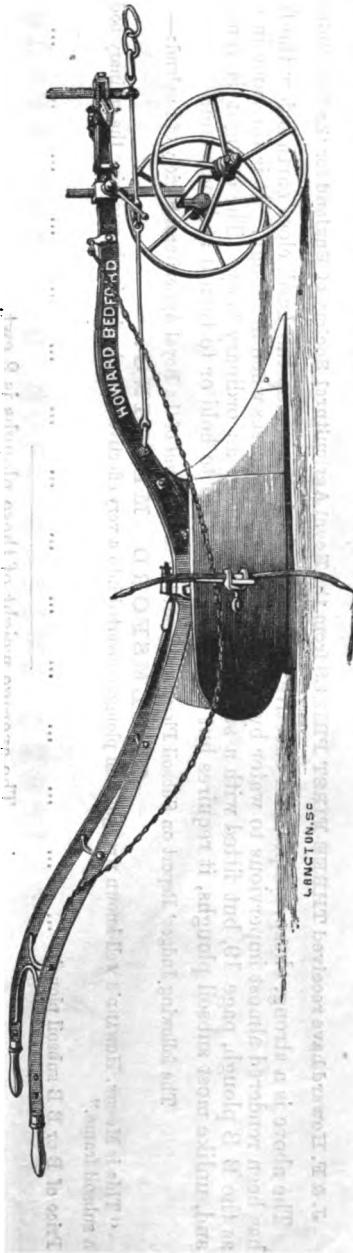
The above is a strong, cheap, simple, and effective implement for breaking up the hard, close earth below the furrow, which has been rendered almost impervious to water by the trampling of the horses when at plough. It is the same in every respect as the B B plough, page 19, but fitted with a subsoil frame instead of an ordinary body. The draught is remarkably light, and, unlike most subsoil ploughs, it requires but the strength of a lad to hold or to turn it at land's end.

The following Judges' Report on Subsoil Ploughs appeared in the *Journal of the Royal Agricultural Society of England*:

"This is Messrs. Howard's well-known wrought-iron plough converted into a very effective subsoiler, by simply removing the ordinary body and attaching  
the subsoil frame."

The average weight of these ploughs is 2 cwt.

## HOWARD'S PATENT DOUBLE-BREAST OR RIDGING PLOUGHS.



The only PRIZE ever offered by the Royal Agricultural Society of England for RIDGING PLOUGHS was awarded to J. & F. Howard.

These Ploughs are intended for moulding up or forming ridges for turnips, mangolds, and potatoes. The breasts are fitted in a neat and simple manner: they can be readily expanded or contracted to any required width, and this independently of each other. By simply removing the breasts, which can be done instantly, and attaching the hoes shown in the annexed engraving, these implements can be used as horse hoes.

J. & F. Howard recommend the size marked B as the most generally useful implement.

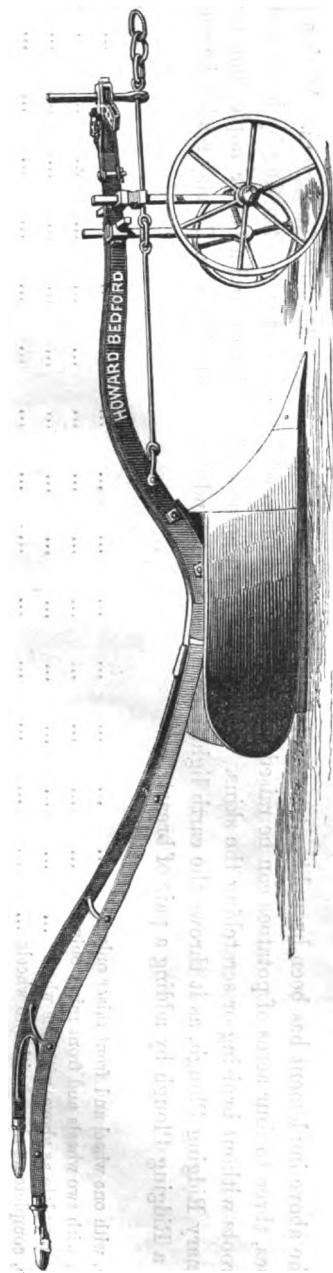
	D	D D	D D	S B	S B	B	B	Steel Breasts.	Iron Breasts.	Steel Breasts.	Iron Breasts.	Steel Breasts.	Iron Breasts.	Steel Breasts.
Iron Breasts.	£2 12 6	£2 17 6	£2 17 6	£3 0 0	£3 7 6	£3 5 0	£3 15 0	£3 10 0	£3 10 0	£3 15 0	£3 10 0	£4 0 0	£4 0 0	£4 0 0
Price, without wheels	...	...	...	3 2 6	3 5 0	3 12 6	3 10 0	4 0 0	4 0 0	3 15 0	4 0 0	4 5 0	4 0 0	4 5 0
Price, with one wheel	...	...	...	3 2 6	3 10 0	3 17 6	3 15 0	4 5 0	4 5 0	4 10 0	4 10 0	4 10 0	4 10 0	4 10 0
Price, with two wheels	...	...	...	3 2 6	3 7 6	3 17 6	3 15 0	4 5 0	4 5 0	4 10 0	4 10 0	4 10 0	4 10 0	4 10 0
If with marker as above, to regulate width of ridges...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
If with a set of hoes, as shown in the above engraving	...	...	...	...	...	...	...	...	...	...	...	...	...	...

A simple Potato Raiser, as shown on the front of the plough, page 36, can be fitted to these ploughs, except the D, for 20s. extra. The average weight of the D and D ploughs is 1*1* cwt. The average weight of the B and B ploughs is 2 cwt.

Howard's original pattern Ridging Plough, marked P, same price as B.



HOWARDS' PATENT DOUBLE-BREAST RIDGING OR PLough, MARKED BB.



The above is intended for ridging up land after the Steam Cultivator, and is calculated to work at a greater depth than the smaller Ridging Ploughs. On farms where the Steam Cultivator is used, it will be found a valuable implement for ridging up land, or laying it in trenches for the winter. It is also equally well adapted for forming ridges for turnips, mangolds, and potatoes.

	Iron Breasts.	Steel Breasts.
Price, without wheels	£4 0 0	£4 10 0
Price, with one wheel	4 6 0	4 15 0
Price, with two wheels	4 15 0	5 5 0
III with marker, as shown on opposite page, to regulate width of ridges...	extra	0 8 6
It with a set of hoes, as shown on opposite page ...	extra	0 11 0

A simple Potato Raiser, as shown on the front of the plough, page 36, can be fitted to this plough for 20s. extra. Case-hardened points and shares of various widths are made to fit the above.

The average weight of this plough is  $2\frac{1}{2}$  cwt.

## HOWARDS' IMPROVED POTATO-RAISING PLOUGH.

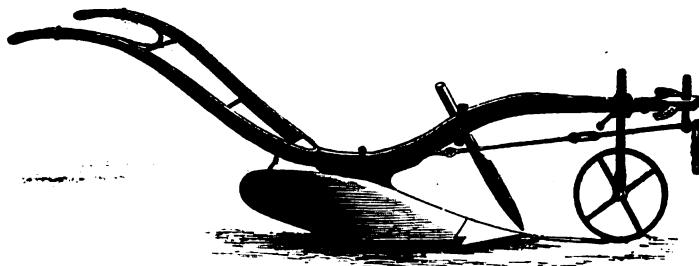


The above implement has been brought out to meet the requirements of Farmers and Market Gardeners. With a pair of horses, three to four acres of potatoes can be raised in a day ; it leaves fewer in the ground than when dug by hand, and raises the roots without bruising or scratching the skins. For earthing up potatoes, it will be found a better implement than the ordinary Ridging Plough, as it throws the earth lightly on to the plants, and the draught is easier. It may readily be converted into a Ridging Plough by adding a pair of breasts.

	<i>p. s. d.</i>
Price, with one wheel and front raiser only...	... 12 6
Price, with two wheels and front raiser only...	... 17 6
Price, complete as above, with one wheel...	10 0
Price, complete as above, with two wheels...	15 0

The average weight of this plough is  $1\frac{1}{2}$  cwt.

## HOWARDS' DWARF PLOUGH, MARKED D.



This Plough is intended to be worked by a small horse or bullock. It is adapted for the light land of the Continent, for stirring loose soil, and for any kind of shallow ploughing where the draught is easy.

	£	s.	d.
Price, as above	...	2	7
Price, with Patent Malleable iron frame	...	12	6

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 5s. extra. Steel side cap, 2s. extra.

The average weight of this plough is  $1\frac{1}{4}$  cwt.

## HOWARDS' DWARF PLOUGH, MARKED D D.



Similar to the above, but rather larger. It is intended to be worked by one horse, and is recommended as a very useful little implement.

	£	s.	d.
Price, with one wheel	...	2	17
Price, with two wheels	...	3	7
P D plough, with one wheel, same as D D, but fitted with lever neck	...	3	5
P D plough, with two wheels, same as D D, but fitted with lever neck	...	3	15
If with Patent Malleable iron frame	...	extra	0
Skim coulter	...	0	5

If fitted with Steel Breast, highly recommended, especially for adhesive soil, 5s. extra. Steel side cap, 2s. extra.

The average weight of these ploughs is  $1\frac{1}{3}$  cwt.

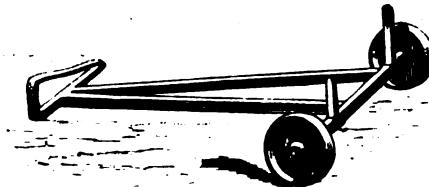
## HOWARDS' IMPROVED RIDGING BODY.



These Bodies can be attached to any of J. & F. Howard's ordinary ploughs.

		£	s.	d.
D ridging body, with iron breasts	... ... ... ... ...	0	18	0
D ridging body, with steel breasts	... ... ... ... ...	1	4	0
D D ridging body, with iron breasts	... ... ... ... ...	1	5	0
D D ridging body, with steel breasts	... ... ... ... ...	1	12	6
B, — B B, — H H, — P P, — S B, or I B, ridging body, with iron breasts	... ... ... ... ...	1	10	0
B, — B B, — H H, — P, — P P, — S B, or I B, ridging body, with steel breasts	... ... ... ... ...	2	0	0
B, — B B, — H H, — P, or P P subsoil body	... ... ... ... ...	0	17	6

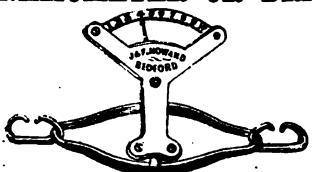
## IMPROVED WROUGHT-IRON PLOUGH SLEDGE.



The above Sledge is fitted with high wheels, and will be found very useful for removing ploughs from one part of the farm to another. The wear of plough blades or soles, by sliding on the roads, is obviated, as well as the liability to strain. The breakages, which often take place in loading or unloading from carts, are also by its use avoided.

		£	s.	d.
Price	... ... ... ... ...	0	10	0

## HOWARDS' DYNAMOMETER OR DRAUGHT GAUGE.



This is a simple Instrument for testing the draught of ploughs or other implements; one end is hooked to the plough, the other to the whippletree; as the horses draw, the spring is collapsed, and the power required is indicated on the dial.

		£	s.	d.
Price, with strong oak case, complete	... ... ... ... ...	3	3	0

A pair of ordinary farm horses, walking at the rate of  $2\frac{1}{2}$  miles an hour, will work a plough the resistance of which is about 3 cwt.

## DIRECTIONS FOR USING HOWARDS' PLOUGHES.

1. The land wheel should be set to the depth the ploughing is required, and the furrow wheel so that the plough is upright when at work: both wheels ought to run slightly towards the work, *i.e.*, to the left.
2. In ploughing the *mould* or last furrow, the land wheel of No. 2 ploughs is turned inside out, or drawn up out of the way.
3. When the wheels are taken off, and the plough is used as a swing plough, a share that is rather worn should be used, the lever neck fixed in the lowest grooves, and the draught chain lowered.
4. When ploughs with two wheels are used on narrow lands or stitches, the ridges should all be drawn out together, as well as the last furrow; the frequent alteration of the wheels will then be avoided.
5. Ploughs with two wheels should, in turning at land's end, be balanced on the furrow wheel.
6. In crossing tilths where it is cloddy, both wheels can be taken off, or the furrow wheel may be retained: the horses should be placed close to the plough, and the draught chain lowered.
7. On wet, sticky soil, where the land wheel clogs, a foot may be used instead of the wheel.
8. If ploughs run too much or too little to land, a piece of leather should be placed between the beam and frame, either round the front or hinder bolt, so as to throw the beam to the left or right as required.
9. In very hard land the horses should be placed about a yard further from the plough, and the head or draught chain lowered, but not so much as to cause the plough to rise from the ground: this arrangement will prevent the breakage of the shares, by causing the plough to run level; the horses also from the same cause work more easily.
10. When the ground is hard or stony, a share with long point should be used, and as the point wears off, the lever neck must be raised into the higher grooves.
11. On clay or soft land a share with short point should be used, and the lever neck fixed in the lower grooves; the head or draught chain should also be lowered, so as to prevent the wheels cutting into the ground.
12. On adhesive soils a steel breast and steel side cap will work cleaner than iron. Steel breasts can be sprung by the hinderstay so as to press the furrow more or less as required.
13. In putting on new breasts and other fittings, a turn should be given to one screw and then to another until all are tight,—*i.e.*, care should be taken not to screw one bolt tight until the other is nearly so: the width of the breast at the heel of the plough should be 8 or  $8\frac{1}{2}$  inches; in B B B and large ploughs, it should be 12 inches.
14. When a new breast is put on, a new slade should be put on also, or the plough will not stand level.
15. The skim coulter should be set so as only just to clear the herbage on the surface, the shallower the better; the hinder part should not be too high from the ground, but set as level as possible; in ploughing the *coming back* furrow, after drawing the first on the ridge, the skim coulter should be set moderately deep so as effectually to bury the grass.
16. A drag chain should be used when ploughing in green crops, stubbles, long dung, and on ley ground.

## HOWARDS' PLOUGH FITTINGS.

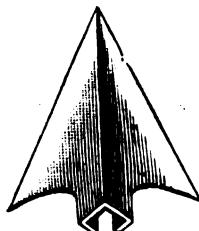
Breast.



Slade.



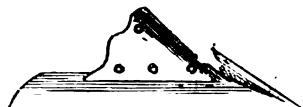
Triangular Share.



Drag Chain, for ploughing in stubble, &amp;c.



Paring Share, with steel blade, for grass land.



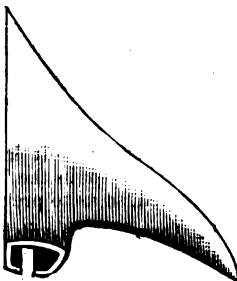
Furrow Presser, to fix on breast of Kent Plough, or for hilly land.



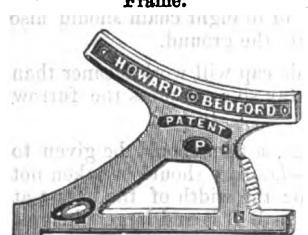
Slide Foot, used in place of land wheel during wet weather on clay land.



Paring Share for stubbles. Either wrought or cast iron.



Frame.

Share.  
Made in various widths and shapes.

Lever Neck, for Share.



## HOWARDS' PLOUGH FITTINGS—(continued).

Rest.



Coulter Stay, to be put on when ploughing among roots, &amp;c.



Skim Coulter Neck and Share.



Share Hook.



Side Cap.



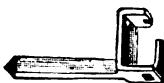
Wrought Coulter Clip.



Furrow Wheel Slide.



Land Wheel Slide.



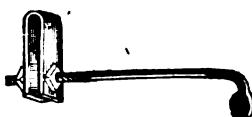
Front Wheel Cap.



Back Wheel Cap.



Breast Stay.



Breast Coupling.



Frame Coupling.



Coulter Loop Screw.



Wheel Loop Screws.

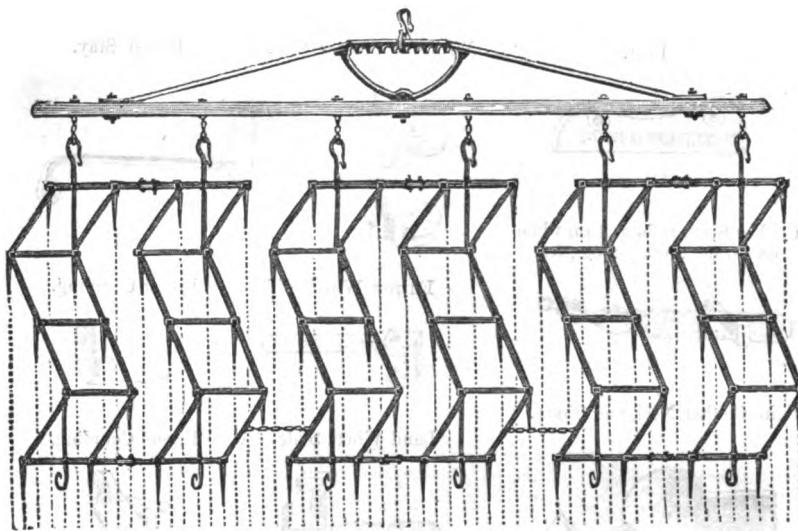


J. & F. HOWARD continue to pay the utmost attention to the wearing parts of their Ploughs, and would recommend those who use their Implements not to purchase any Castings unless known to be of their manufacture, and MARKED WITH THEIR NAME, or they cannot be held responsible either for their fitting or wearing properly.

J. & F. HOWARD strongly recommend those who use their Ploughs to send them to their Manufactory when requiring a thorough repair.

B\*

## HOWARDS' PATENT JOINTED IRON HARROWS.



FIFTY THOUSAND Sets of the above are in use.

At the Last Trials of the Royal Agricultural Society of England,

at Newcastle, J. & F. Howard gained

**ALL THE PRIZES** for Harrows in **ALL THE CLASSES**;

**AND FOR THE LAST ELEVEN YEARS**

J. & F. Howard have received

**EVERY FIRST PRIZE** for Harrows in **EVERY CLASS**, both for  
Steam and Horse Power.

J. & F. Howard have received altogether from the Royal Agricultural  
Society of England,

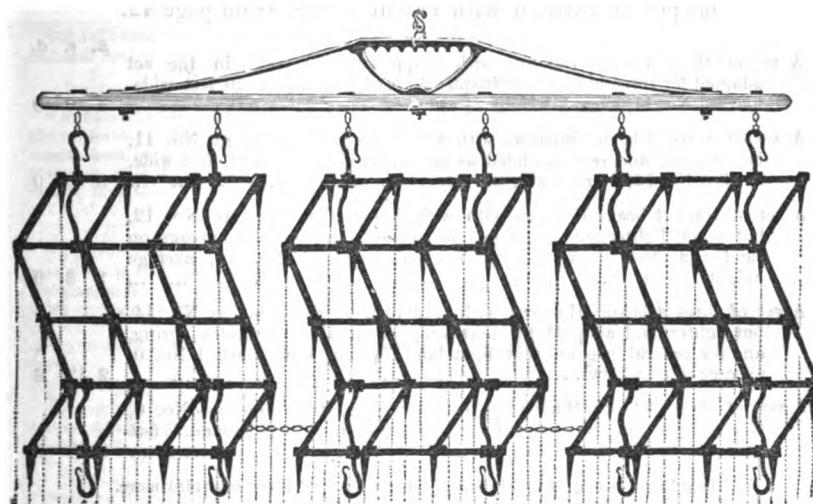
**SIXTEEN FIRST PRIZES** for the **BEST HARROWS**,

being the largest number of Prizes awarded to any kind  
of Harrows ever exhibited.

These Harrows are the same in principle as those shown on the  
following page, but are furnished with joints in the centre of each  
Harrow, which allow them to adapt themselves to the form of the ridges  
or any unevenness of the surface; by a simple arrangement, these joints  
may be instantly locked, or allowed as much play as required.

It is found desirable in very rough work to fasten the joints.

## HOWARDS' PATENT ZIGZAG IRON HARROWS.



These Harrows are simple, strong, and durable, and thoroughly adapted for every description of work.

The teeth are fitted into the frames in a simple and secure manner, and by means of a stop or guard the nuts are prevented from shaking loose; when thus fitted, the harrow is as firm as if all parts were welded together, and not more liable to shake loose. The teeth are so placed that each cuts a separate track at equal distances. The draught being central is also of great advantage; the irregular pace of the horses does not affect their working, as when the horses are attached to each end of the whiffletree.

Each harrow is attached to the whiffletree by double hooks, which prevent them, in rough work and turning, from *riding* on each other, and also when working upon the side of a hill, from inclining toward the lower ground. They are furnished with hooks at the hinder part, in order to draw them the contrary way when harrowing in seeds or spring crops; by this means the soil is not rooted up or penetrated so deeply as when drawn forward in the usual way.

B\* 2

**PRICES OF HOWARDS' ZIGZAG HARROWS,**  
with Five Rows of Teeth.

6s. per set extra, if with Patent Joints, as on page 42.

	£. s. d.
A set of three 4-beam Harrows with whippletree, 60 teeth in the set, adapted for three horses, but frequently used with a pair, 10 feet wide, marked No. 11, average weight 2½ cwt. ... ... ... ...	4 0 0
A set of three 4-beam Harrows with whippletree, the same as No. 11, but lighter, and recommended as general seed harrows, 9½ feet wide, marked No. 12, average weight 1½ cwt. ... ... ... ...	3 10 0
A set of three 4-beam Harrows with whippletree, the same as No. 12, but much lighter, and recommended as finishing or seed harrows on sand and other light land, 8½ feet wide, marked No. 14, average weight 1½ cwt. ... ... ... ...	3 3 0
A set of three 4-beam Harrows with whippletree, the same as No. 14, but lighter, and adapted for harrowing in small seeds in the spring, and for general use on very light land, 7½ feet wide, marked No. 0, average weight 1 cwt. ... ... ... ...	2 17 6
A set of three 4-beam Harrows with whippletree, the same as No. 0, but still lighter, and adapted for one horse on very light land, 7 feet wide, marked No. 0 0, average weight ¾ cwt. ... ... ... ...	2 10 0

These Harrows may be had in sets of four at a cost of about one-third more.

**PRICES OF HOWARDS' ZIGZAG HARROWS,**  
with Six Rows of Teeth.

6s. per set extra, if with Patent Joints, as on page 42.

	£. s. d.
A set of three 4-beam Harrows with whippletree, 72 teeth in the set, adapted for three horses, 10½ feet wide, marked No. 10, average weight 2½ cwt. ... ... ... ...	5 0 0
A set of three 4-beam Harrows with whippletree, the same as No. 10, but lighter, and adapted for a pair of horses, 9½ feet wide, marked No. 13, average weight 1½ cwt. ... ... ... ...	4 0 0
A set of three 4-beam Harrows with whippletree, similar to No. 13, but much lighter, and highly recommended as seed harrows, 8½ feet wide, marked No. 15, average weight 1½ cwt. ... ... ... ...	3 6 0

These harrows may be had in sets of four at a cost of about one-third more.

**PRICES OF HOWARDS' THREE-BEAM HARROWS.**

These Harrows are not made with the Patent Joints.

	£. s. d.
A set of four 3-beam Harrows with whippletree, the same strength as the 4-beam No. 10, but more adapted for land of uneven surface; they are preferred by many, for by taking off one harrow they are brought at all times within the power of two horses; 10½ feet wide, marked No. 10, average weight 2½ cwt. ... ... ... ...	5 5 0
If with three Harrows to the set, average weight 2½ cwt. ... ... ...	4 0 0
A set of three 3-beam Harrows with whippletree, the same strength as the 4-beam No. 11, but suitable for a pair of horses, 7½ feet wide, marked No. 11, average weight 1½ cwt. ... ... ... ...	3 10 0

## HOWARDS' PATENT HARROWS.

The following Judges' Reports on Harrows have appeared in the *Journal of the Royal Agricultural Society of England* :—

### YORK MEETING.

"Fifteen sets were selected for trial. We saw no material improvement in any of them with the exception of a set brought out by Messrs. HOWARD. These have joints in the centre, which allow them to work on uneven land almost as well as where it is flat and level; this invention, though simple, we considered a valuable improvement, and accordingly awarded the prize to Messrs. HOWARD."

### EXETER MEETING.

"The Judges highly approved of Messrs. HOWARD's patent jointed harrows, and the decision was given in their favour; they consider these harrows better calculated than any others for working on the sides of furrows, &c., and strongly recommend them to those who have their crops sown on the narrow *stitch*, as they cling round the edge of the furrow, leaving it pulverized in a convex form, at the same time searching the bottom of the furrow; the joints having no tendency to work upward, they are equally applicable to level lands."

### LEWES MEETING.

"An unusually large number of harrows were selected and tested. Messrs. HOWARD's accomplished admirably all that could be expected of harrows to perform, and we awarded them the first prize."

### GLOUCESTER MEETING.

"Messrs. HOWARD's jointed harrows adapted themselves admirably to the unevenness of the land, while they can be made fast for level ground if requisite. We awarded them the first prize."

### CARLISLE MEETING.

"The harrows were tried upon ridge or furrow lands; those by Messrs. HOWARD, jointed near the ends, were admirably adapted for these inequalities of surface, and made excellent work. There being no prize offered, we highly commended the harrows of Messrs. HOWARD."

### CHELMSFORD MEETING.

"Messrs. HOWARD's harrows covered their ground well, cut deeply, and might be worked either way: they have a simple contrivance of hoop iron under the nut to keep it in place; the price of them is moderate, the form is peculiar, and, being jointed in the centre, they suit round stitches as well as flat lands. The first prize was therefore awarded to Messrs. HOWARD for their light harrows, the first prize for their general purpose harrows, and the first prize for their heavy or drag harrows."

### WARWICK MEETING.

"*Harrows for light land.*—These were tried on land that had been previously ploughed, and which was a very good test. Some made very indifferent work; in fact, it would be impossible for a greater difference to be shown in the work done. We awarded to Messrs. HOWARD the first and the second prizes."

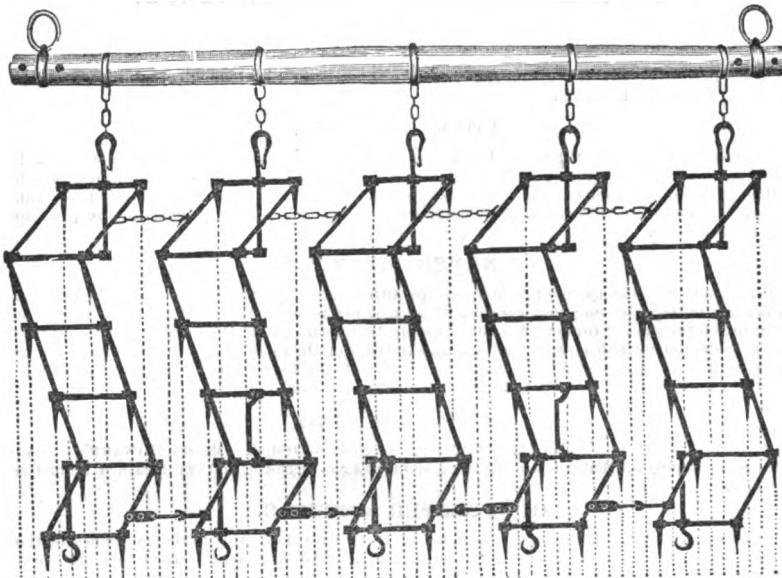
### NEWCASTLE MEETING.

"*Harrows.*—There were forty-one selected for competition, comprising all sorts of harrows for light and heavy land. This class of implements is, perhaps, more remarkable for varieties in construction than any other; besides the well-recognized zigzag harrow, they came before us under the different appellations of combined harrow and scarifier, lever scuffling, rotating, jointed, chisel-toothed, duck-footed, excelsior, flexible, chain, extirpator, &c.

"The first trial took place on a piece of very foul land that had been broken up by the cultivators with the broad shares, and was so severe a test that very few of them could get through their task without choking. The next trial was on a piece of clean fallow which had been ploughed a few days previously. Here they all, whether designed for light or heavy land, made such good work that we found it necessary to select a few of the implements for a third trial on a piece of clover-ley, which had been ploughed by steam. This answered the purpose admirably. The large number and the great variety of these implements render it impossible fully to discuss in detail, in this report, the merits of their different modes of construction; several among them, although not mentioned in our awards, are well deserving of notice, and would prove very useful on suitable land. It being our duty to consider what implements were best adapted to the country at large, we award three prizes of £8, £7, and £5 to Messrs. J. and F. HOWARD for their three sizes of harrows." These were the only prizes awarded.

The above is the last Report issued by the Society.

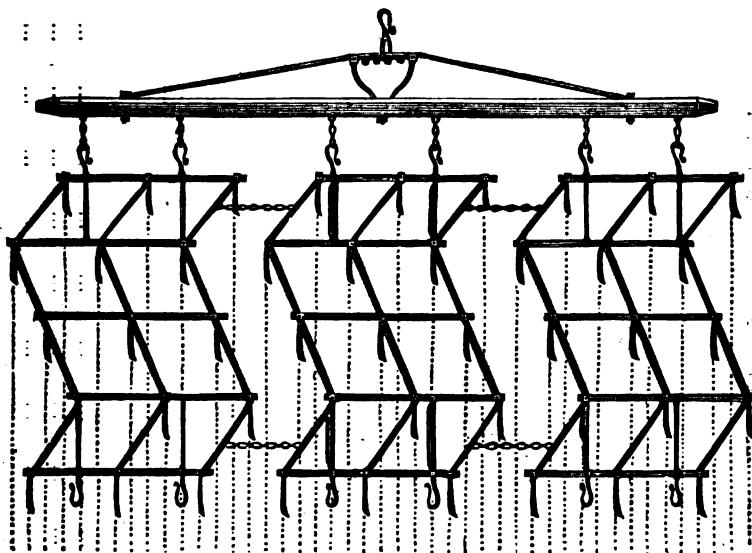
## HOWARDS' PATENT TWO-BEAM HARROWS.



These Harrows are adapted for land ploughed in small *stitches* of eight, ten, or twelve furrows. Each of the harrows having but two beams they adapt themselves to the shape of the ridge, and fall into the furrows better than wider harrows. The couplings are made with an improved joint, which preserves the relative distance of the harrows.

	£	s.	d.
A set of four 2-beam Harrows with whiffletree, 48 teeth in the set, adapted for 8-furrow stitches, 7½ feet wide, marked No. 18, average weight 2 cwt.	4	5	0
A set of five 2-beam Harrows with whiffletree, for 10-furrow stitches, 9½ feet wide, marked No. 18, average weight 2½ cwt.	5	0	0
A set of six 2-beam Harrows with whiffletree, for 12-furrow stitches, 11 feet wide, marked No. 18, average weight 3 cwt.	5	15	0
A set of five 2-beam Harrows with whiffletree, similar to No. 18, but rather lighter, 7½ feet wide, marked No. 19, average weight 2 cwt.	4	5	0
A set of six 2-beam Harrows with whiffletree, for 10-furrow stitches, 9½ feet wide, marked No. 19, average weight 2½ cwt.	5	0	0
A set of seven 2-beam Harrows with whiffletree, for 12-furrow stitches, 11 feet wide, marked No. 19, average weight 2½ cwt.	5	15	0
A set of five 2-beam Harrows with whiffletree, upon the same principle as Nos. 18 and 19, but of smaller size, and adapted for light land, 7½ feet wide, marked No. 20, average weight 1½ cwt.	3	16	0
A set of six 2-beam Harrows with whiffletree, for 10-furrow stitches, 9½ feet wide, marked No. 20, average weight 2 cwt.	4	8	0
A set of seven 2-beam Harrows with whiffletree, for 12-furrow stitches, 11 feet wide, marked No. 20, average weight 2½ cwt.	5	0	0
A set of five 2-beam Harrows with whiffletree, similar to No. 20, but rather smaller, and adapted for very light land, 7½ feet wide, marked No. 21, average weight 1½ cwt.	3	5	0
A set of six 2-beam Harrows with whiffletree, for 10-furrow stitches, 9½ feet wide, marked No. 21, average weight 1¾ cwt.	3	17	6
A set of seven 2-beam Harrows with whiffletree, for 12-furrow stitches, 11 feet wide, marked No. 21, average weight 2 cwt.	4	10	0

## HOWARDS' PATENT IRON DRAG HARROWS.



For the LAST ELEVEN YEARS J. & F. Howard have received from the  
 Royal Agricultural Society of England  
 ALL the FIRST PRIZES for the BEST DRAG HARROWS.

The above are made upon the same principle as those previously described, but are much larger and stronger. They are made with long curved teeth, and are intended as a substitute for the heavy wooden drag harrows. They can be used with three or four horses on rough fallows, and are made to draw backward or forward.

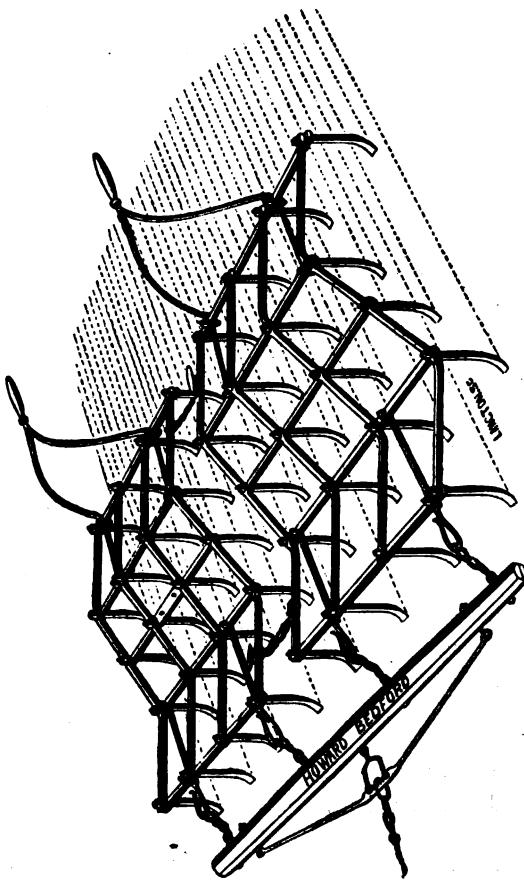
These Harrows are often used instead of Scarifiers, and for a good deal of work are found more efficient.

A pair of 3-beam strong drag Harrows with whippletree, 7½ feet wide, teeth 12 inches long, marked No. 16, average weight 2½ cwt.      ...      ...      ...      5 15 0

A set of three 3-beam drag Harrows with whippletree, upon the same principle as No. 16, but lighter, and made to cover more ground, 10½ feet wide, teeth 10 inches long, marked No. 17, average weight 3½ cwt.      ...      6 6 0

A set of three 3-beam drag Harrows with whippletree, similar to No. 17, but much lighter, 9 feet wide, teeth 9 inches long, marked No. 18, average weight 2½ cwt.      ...      ...      ...      ...      ...      ...      ...      ...      4 15 0

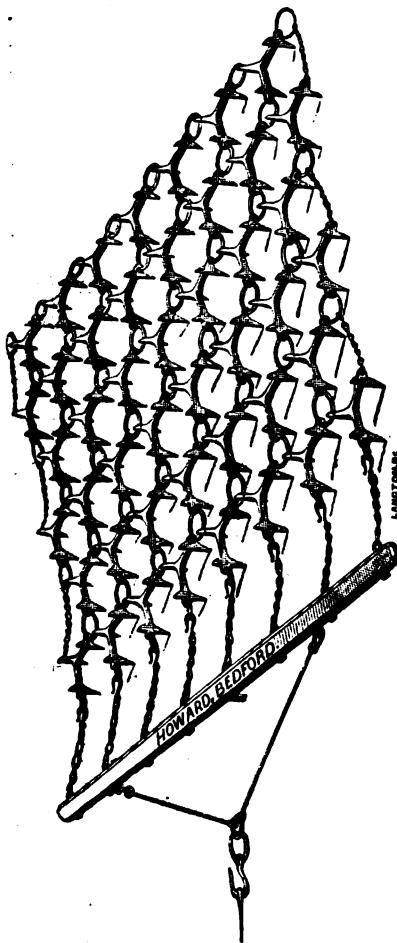
## HOWARD'S PATENT HANDLED DRAG HARROWS.



These are the same as J. & F. Howard's ordinary Drag Harrows, but furnished with handles, which enable the man to press the tines into the ground, or lift them up to clear them, as occasion may require.

	£	s.	d.
A pair of 3-beam Harrows with whippletree, marked H 16, average weight 3 cwt.	...	...	0
A pair of 3-beam Harrows with whippletree, marked H 17, average weight 2 cwt.	...	...	0
A pair of 4-beam Harrows with whippletree, marked H 17, average weight 2½ cwt.	...	...	0
J. & F. Howard recommend the 4-beam Harrows, marked H 17, as the most useful size.	...	...	0

## HOWARDS' PATENT FLEXIBLE OR. CHAIN HARROW.

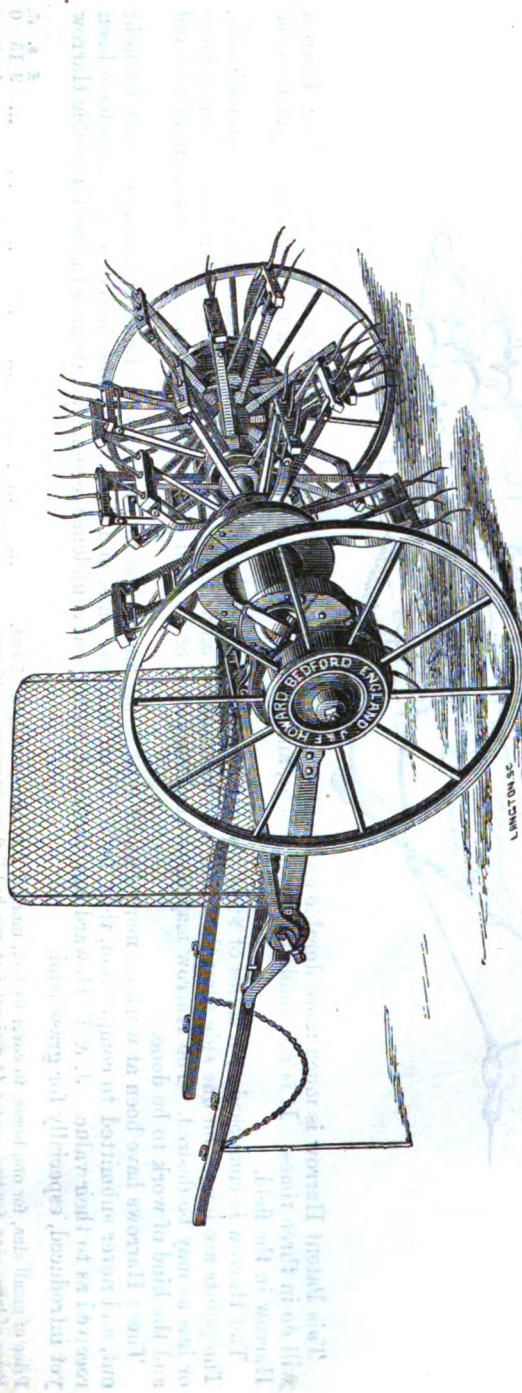


This Patent Harrow is much more durable and will do as much in going over the land once as the ordinary Chain Harrow will do in three times. It is not liable to derangement, and its construction is so simple that a new link can be put into the Harrow in the field.

The Harrow is composed of a series of steel links, connecting tripod-shaped tines with case-hardened points on each side. The Points are longer on one side than the other, and are rounded off at the back. The ground, therefore, is penetrated more or less as may be desired. 'The Harrow may be worked backward or forward on either side, according to the state of the land or the field.

These Harrows have been at work on many hundreds of farms for the last four seasons ; and although only recently brought out, and never submitted to competition, they have had an immense sale, and the highest unsolicited testimonials have been received as to their value. J. & F. Howard can, therefore, with great confidence recommend them as the best Flexible Harrow yet introduced, especially for grass land.

## HOWARD'S PATENT DOUBLE-ACTION HAYMAKER.



### HOWARD'S PATENT HAYMAKERS gained the FIRST THREE PRIZES last offered by the Royal Agricultural Society of England;

and they have never been beaten in any Trial at which J. & F. Howard have competed, either at home or abroad.

The following Judges' Report on Haymakers has appeared in the *Journal of the Royal Agricultural Society of England* :—

#### PLYMOUTH MEETING, 1865.

“The two Haymaking Machines exhibited by Messrs. Howard, [to which the first prizes were awarded] made superior work, and are strong clever implements. . . . The axle in these machines is a solid bar of steel, which is found to be strong, and not liable to bend. . . . The form of the tines is good. The forward action effects a complete separation of the grass, and the back action leaves the crop light and loose.”

The above is the last Report issued by the Society.

J. & F. HOWARD direct special attention to their **PATENT HAYMAKERS**, which have been thoroughly tested, and in which important improvements, suggested by several years' experience, have been introduced.

The many improvements which they contain, not only increase the durability and efficiency of these important Machines, but have tended to secure for them, thus early, their present unrivalled position. The fork barrels are so arranged as to render clogging all but impossible: the forks are mounted in sets of three, and placed in a zigzag position, an arrangement which equalizes the work, and more perfectly separates and distributes the crop.

The usual method of reversing the motion in double-action machines has hitherto been—either by loose sliding pinions by means of clutches on the fork barrels, or by sliding the fork barrels themselves; the last plan having the obvious disadvantage of altering the relative positions of the forks, and rendering the machine continually liable to clog.

In J. & F. Howard's Patent Machines the gear work is both strong and simple, and as the motion can be changed in an instant to the backward or forward action by a simple eccentric movement of the main axle, the disadvantages alluded to are entirely obviated. For adapting the machine to the nature of the crop, a similar eccentric movement is also used for raising or lowering the fork barrels from or to the ground.

The New Patent Haymakers, with the above improvements, are manufactured with the greatest care; and as every part of the machine liable to strain is made of wrought or malleable iron, they may safely be removed any distance without fear of breakage, and without the necessity of taking them to pieces.

As the hay harvest is a season of the greatest importance and anxiety to the farmer, the value of a first-class Haymaker, not liable to get out of order, can hardly be rated too highly. In many cases, its use in a single season more than repays its cost.

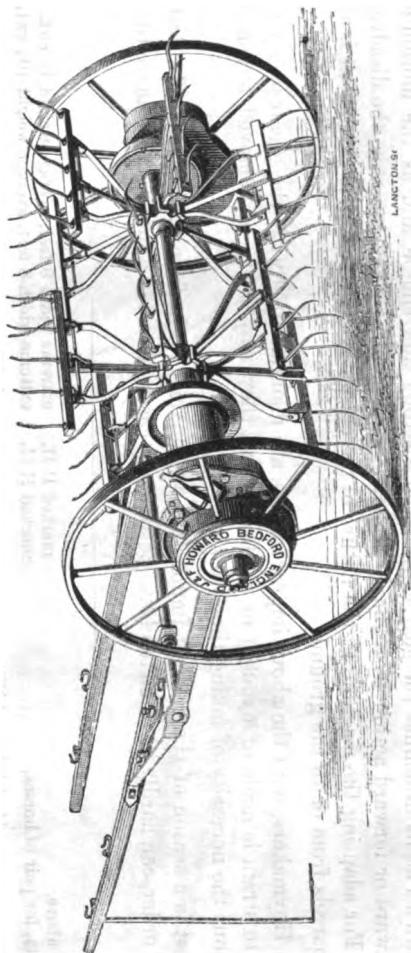
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Price, for one horse, as above,	£	15	s.	d.
Price, with double shafts, for pair of horses,	..	..	15	0
marked H. H., extreme width 8 feet, average weight 10 cwt.	..	..	16	0
marked H. H., extreme width 8 feet, average weight 10½ cwt.	..	..	16	0

If with Patent Wire Screen, to prevent the grass lodging on the front, 15s. extra.

J. & F. Howard recommend this machine as the most useful size, being equal to the heaviest crops.

HOWARDS' PATENT DOUBLE-ACTION HAYMAKER, FOR SMALL OCCUPATIONS.

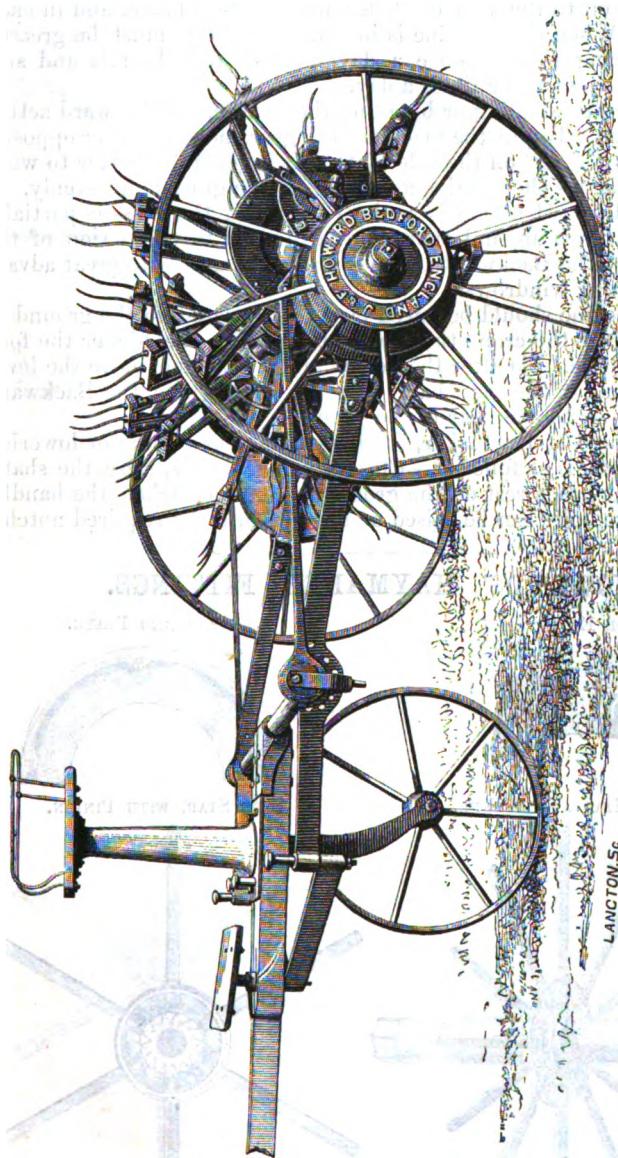


HOWARDS' PATENT HAYMAKERS gained the FIRST THREE PRIZES last offered by the Royal Agricultural Society of England ; and they have never been beaten in any Trial at which J. & F. Howard have competed, either at home or abroad.

This Machine is similar in construction to the H. H. It has the double-action, and the same gearing and patent eccentric motion for reversing the action of the fork barrels; but the travelling wheels are smaller, and the fork heads are not set zigzag. It is a strong machine, and J. & F. Howard recommend it where a small machine is required.

	<i>f.</i>	<i>s.</i>	<i>d.</i>
Price, marked S H, extreme width 7 $\frac{1}{4}$ cwt.	•	•	•
Price for lowering forks, marked H, extreme width 7 $\frac{1}{4}$ feet, average weight 8 cwt.	•	•	•
If with Patent Wire Screen, to prevent the grass lodging on the front, 15s. extra.	•	•	•

## HOWARDS' PATENT DOUBLE-ACTION HAYMAKER FOR TWO HORSES.



HOWARDS' PATENT HAYMAKERS gained the FIRST THREE PRIZES last offered by the Royal Agricultural Society of England; and they have never been beaten in any Trial at which J. & F. Howard have competed, either at home or abroad.

Price, as above, with front wheel and seat for driver, marked H H, extreme width 8 feet, average weight 12 cwt. . . £18 18 0  
If with Patent Wire Screen, to prevent the grass lodging on the front, 15s. extra.

## DIRECTIONS FOR USING HOWARDS' HAYMAKER.

1. To prepare the machine for work, take off the travelling wheels, grease the axles, see that the gearing is clean, and supply a little of the *best* machine oil to the two oil holes in each fork barrel and in each side plate. When the machine is in work, the axles must be greased and the gearing cleaned once a day, and the fork barrels and side plates oiled two or three times a day.

2. For the first tedding or breaking the swathe, the Forward action should be used. To put the machine into gear, move the lever opposite to the letters "F A" on the side plate. It is generally better to work the machine *across* the swathe, as it spreads the grass more evenly.

3. The Backward action is to be used when the grass is partially dried, to lighten it up, and thoroughly expose it to the action of the sun and air. The Backward action may also be used with great advantage for opening windrows.

4. The machine should be raised from and lowered to the ground to suit the state of the crop; the heavier the crop is, the higher the fork barrels should be. To alter the height of the machine, move the lever fixed to the end of the shaft bar. When working with the Backward action, set the machine near to the ground.

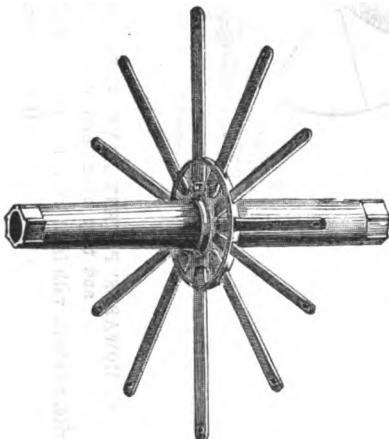
5. With the S H Haymaker, the best method of raising or lowering the fork barrels is as follows:—Close the fork-heads, raise the shafts gently till the heads rest on the ground, and then slacken the handle-nuts until the bolts can be raised or lowered into the required notch.

## HOWARDS' HAYMAKER FITTINGS.

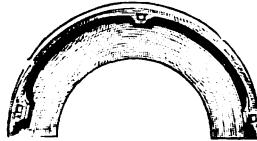
OFF SIDE ECCENTRIC.



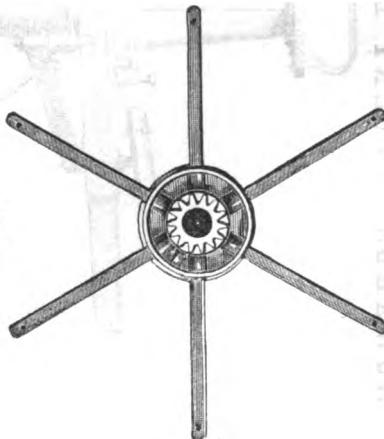
CENTRE STAR AND BARREL.



COVERING PLATE.

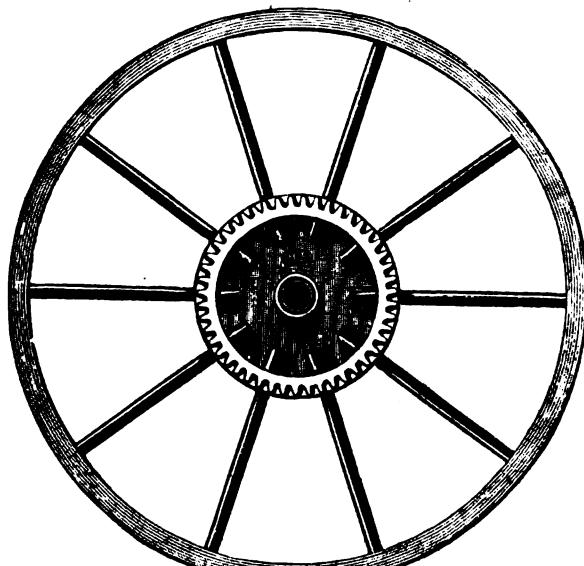


SIDE STAR, WITH PINION.

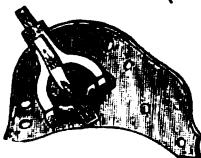


## HOWARDS' HAYMAKER FITTINGS—(continued).

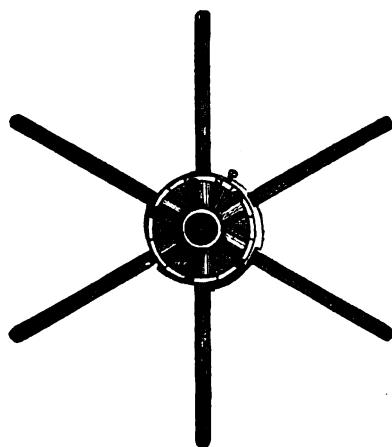
WHEEL.



NEAR SIDE ECCENTRIC (Outside).



SIDE STAR.

FORK HEAD CASTING  
for Spring.FORK HEAD  
CASTING.

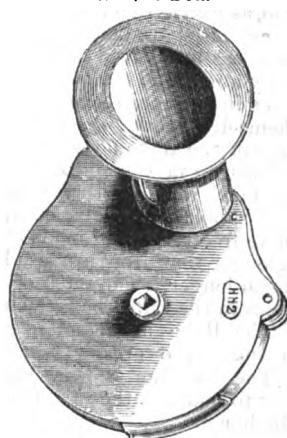
LOOSE PINION.



NEAR SIDE ECCENTRIC (Inside).

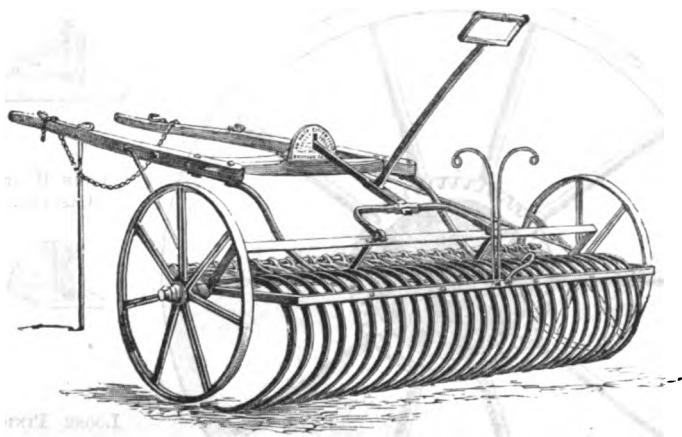


WHEEL BOX.



In ordering any part of the machine which may be accidentally broken, or requires renewal, the letter and number marked on it, and the year when it was supplied, should be stated.

**HOWARDS' NEW PATENT HORSE RAKE,  
MARKED X or XX.**



**MORE THAN FIFTEEN THOUSAND ARE IN USE.**

For the last **FIFTEEN YEARS** J. & F. HOWARD have won  
**EVERY FIRST PRIZE** offered by the Royal Agricultural Society of England  
 for **HORSE RAKES**;  
 and they have never been beaten in any Trial at which they have competed  
 either at home or abroad.

J. & F. HOWARD'S NEW PATENT HORSE RAKES have several advantages over their former patterns, in the arrangements for raising the teeth and in the delivery of the crop.

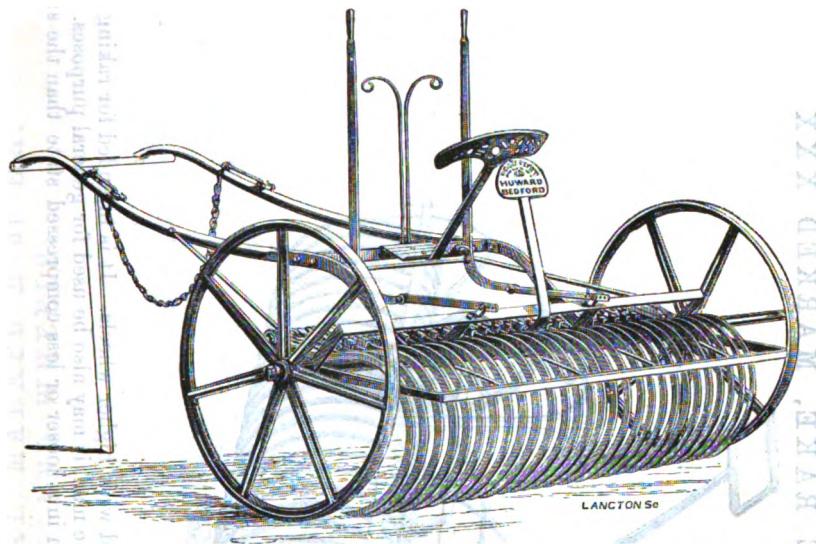
A central axle of steel runs from end to end of the Implement, which gives great stiffness, and to this axle the drawing shafts are attached. The axle, as well as carrying the wheels, forms a fulcrum on which the teeth when being raised are balanced, and by this action the teeth when emptying are more easily relieved of their load.

By a new and very simple arrangement of the Patent Leverage, the teeth when in work are raised from the central axle, and are thus left free to adapt themselves to the irregularities of the surface. At the same time, the front part of the Rake on which the teeth are suspended is held in position by a self-acting movement of the lever. The teeth being curved or sickle-formed, are much stronger than if made angular; they are formed so as to collect less rubbish with the corn, and the hay or corn works round them much more freely. Being made of steel, and tapered, they are much lighter and stronger than iron, are less liable to get strained or out of shape, and wear much longer. The pitch of the teeth is altered by means of the regulating holes in the radial bar which passes through the name plate.

The Rakes are mounted on high wheels, hooped with wrought iron, and the naves are capped, to prevent the hay, &c., working round the axles.

The leverage is very simple, and while requiring but the strength of a boy to manage, the rake can be easily emptied of its load without stopping the horse.

	<i>s. s. d.</i>
Marked X with 24 steel teeth, and wheels 32 inches high, extreme width $7\frac{1}{2}$ feet, average weight 4 cwt.	$\dots \dots \dots \dots \dots \dots \dots$ 8 0 0
Marked XX with 28 steel teeth, and wheels 36 inches high, extreme width $8\frac{1}{2}$ feet, average weight 4 $\frac{1}{2}$ cwt.	$\dots \dots \dots \dots \dots \dots \dots$ 8 15 0

HOWARDS' NEW PATENT HORSE RAKE,  
WITH SEAT.

The above Rakes are similar to those described on the opposite page, but are fitted with seat for driver, and with suitable leverage for emptying the load.

Marked S	with 24 steel teeth, and wheels 32 inches high, extreme width 7 $\frac{1}{2}$ feet, average weight 4 cwt.	2 s. d.	8 10 0
Marked S S	with 28 steel teeth, and wheels 36 inches high, extreme width 8 $\frac{1}{2}$ feet, average weight 4 $\frac{1}{2}$ cwt.	..	9 5 0
Marked S S S	with 28 steel teeth, and wheels 42 inches high, extreme width 8 $\frac{1}{2}$ feet, average weight 5 cwt.	..	10 5 0

The following Judges' Reports on Horse Rakes have appeared in the *Journal of the Royal Agricultural Society of England* :—

## EXETER MEETING.

“Messrs. HOWARD's horse rake performed its work exceedingly well—raking clean when full, and littering none ; we therefore awarded the first prize to Messrs. HOWARD.”

## LEWES MEETING.

“Nine were tried on some newly cut grass where the haymakers had been previously tested. With the exception of Messrs. HOWARD's, they were all liable to one or two of the following faults—viz., that the grass collected was too much compressed, the delivery unsatisfactory, or the leverage not instantaneous. A second trial was made on clover-ley, upon which straw was scattered in order to test their merits as stubble rakes, and here also Messrs. HOWARD's was the most effective implement. The first prize was therefore awarded to Messrs. HOWARD.”

## SALISBURY MEETING.

“The teeth of Messrs. HOWARD's rake are made of steel, of great length, curve, and capacity, so that obstructions rarely interfere, and they can be adjusted so as to ride over the ground and gather the barley without soil. The lifting bar is above the teeth, which gives an advantage in filling and emptying. It takes 7 $\frac{1}{2}$  feet ; it drew up the heavy grass admirably, and its clean raking was perfect. This implement is also fitted as a weed extirpator, and the first prize was awarded to it.”

## LEEDS MEETING.

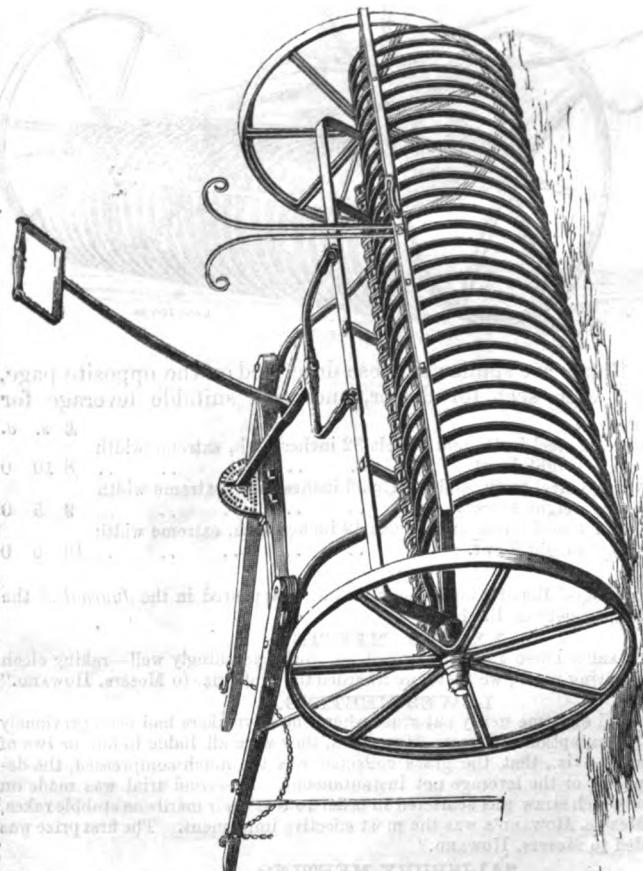
“Messrs. HOWARD's horse rake was superior to any exhibited, and received the prize of ten pounds.”

## PLYMOUTH MEETING, 1865.

“The entry of horse rakes was large ; but Messrs. HOWARD's were so manifestly superior that the decision as to the first prize was a very simple business.”

*The above is the last Report issued by the Society.*

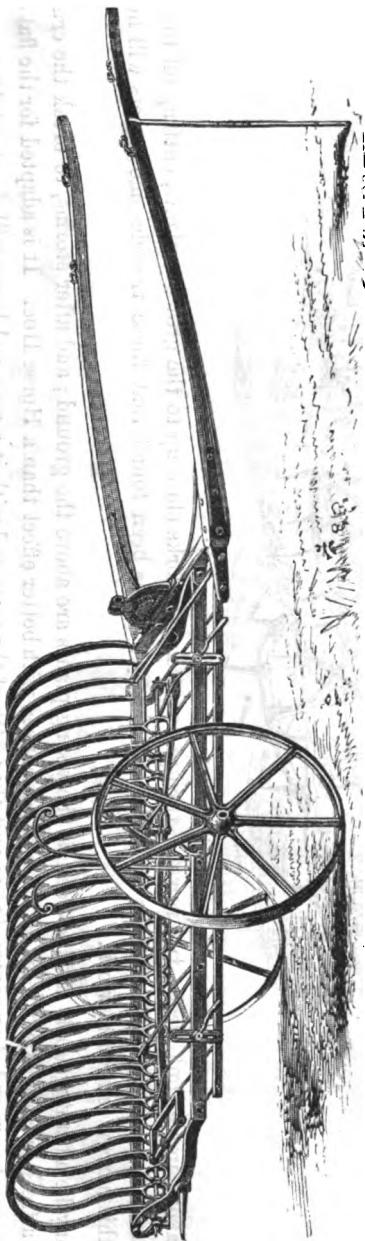
## HOWARDS' NEW PATENT HORSE RAKE, MARKED XXX.



This is a larger Rake than those described on page 56, and is fitted with higher wheels. It is intended for raking heavy meadow crops, and for windrowing; but as it is within the power of one man, it may also be used for general purposes. This rake is preferred by many for general use, as it leaves the hay and corn in a looser or less compressed state than the smaller sizes, and is better adapted for heavy crops.

Price, with 28 steel teeth, and wheels 42 inches high, extreme width 8½ feet, average weight 5 cwt. £9 15 0

HOWARD'S PATENT HORSE RAKE, MARKED H or HH,  
WITH MOVEABLE SHAFTS AND WHEELS.

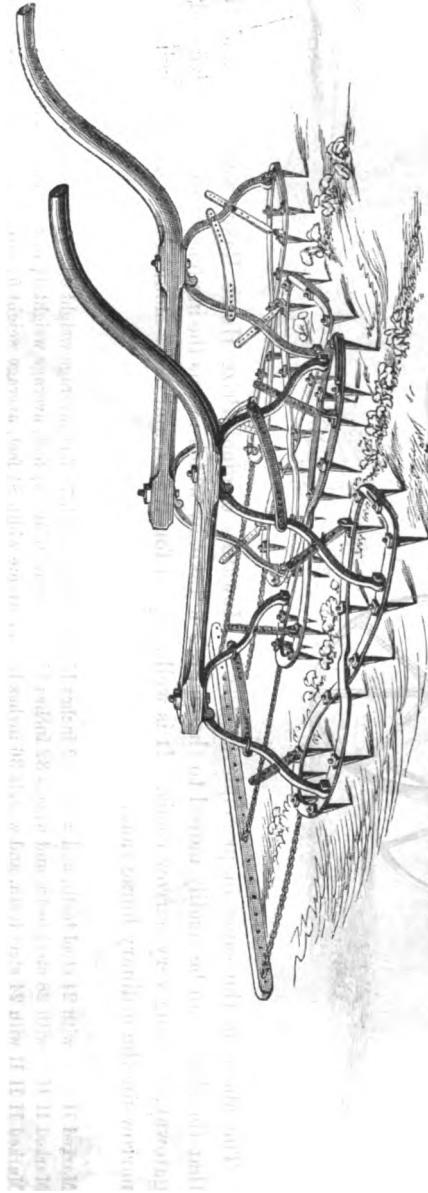


The above is the same in principle as J. & F. Howard's original Prize Horse Rakes, marked H and HH, but made so that the shafts can be readily moved to the end of the rake, by which means the implement can be drawn endwise through any gateway, or along very narrow roads. It is well adapted for Wales, and other mountainous districts, where the roads are too narrow for the ordinary horse rake.

	£	s.	d.
Marked H with 24 steel teeth, and wheels 32 inches high, extreme width 7½ feet, average weight 4½ cwt.	..	..	..
Marked H H with 28 steel teeth, and wheels 32 inches high, extreme width 8½ feet, average weight 4½ cwt.	..	..	..
Marked H H H with 24 steel teeth, and wheels 36 inches high, extreme width 8½ feet, average weight 5½ cwt.	..	..	..

If with moveable shafts and wheels, as above, 15s. extra.

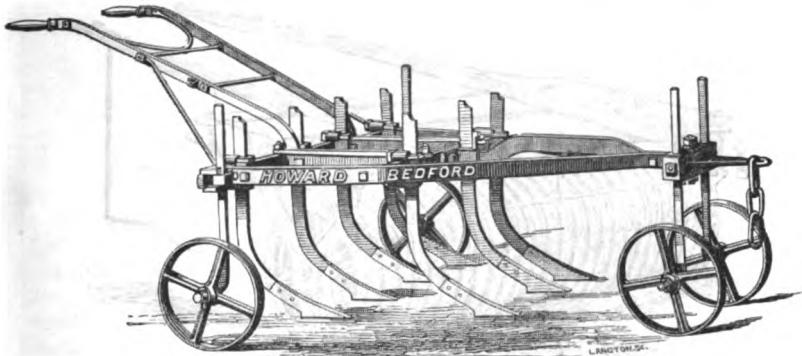
HOWARDS' IMPROVED PATENT TURNIP HARROW.



The above implement cleans two rows of turnips at once. It works close up to the growing plants, cutting off the weeds and, what is more important, it checks the ravages of the fly; it has been found that these troublesome insects will not stay where this harrow is kept at work.

It may be advantageously used as soon as the young plants are above the ground ; and after storms, to break the crust and expose a fresh surface of earth ; it can also be often used with better effect than a Horse Hoe. It is adapted for the flat as well as ridge, can be expanded or contracted to suit the width of the rows, and with it a man and horse will do about 10 acres a day.

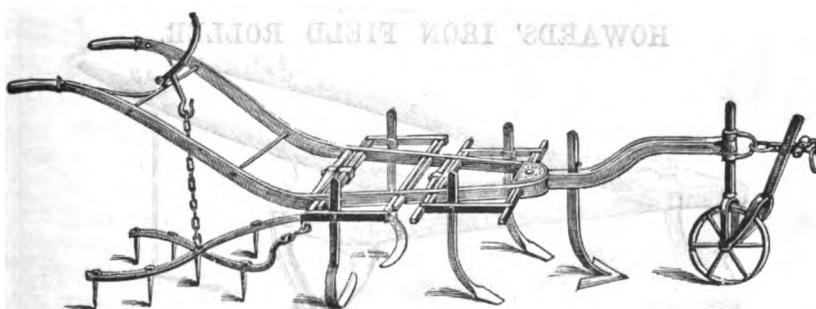
## HOWARDS' WROUGHT-IRON SCARIFIER.



This Implement is made entirely of wrought iron ; the tines can be placed nearer or farther from each other according to the state of the land, and are so formed that they do not cut or break the "couch" into short lengths, but draw it from the soil and deliver it on the surface. When using this implement it is desirable to scarify the headlands first.

	£	s.	d.
Price, with 5 tines, average weight 3½ cwt. . . . .	5	15	0
Price, with 7 tines, average weight 4½ cwt. . . . .	6	15	0
Price, with 9 tines, average weight 4½ cwt. . . . .	7	15	0
Price, with 11 tines, average weight 5 cwt. . . . .	8	15	0

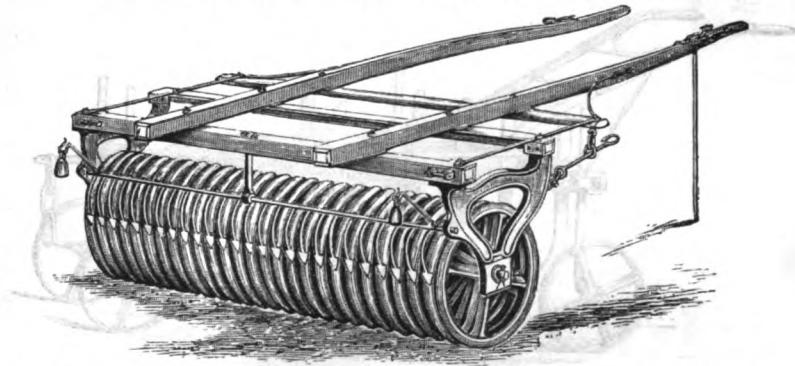
## HOWARDS' EXPANDING HORSE HOE.



This implement is intended for one row of turnips, potatoes, or beans, or for three rows of wheat, barley, &c. The hoes are made to suit the different widths of the rows, and are so arranged that the frame never projects beyond the outside hoes. The advantage of this arrangement is very great when hoeing high-standing crops. It is fitted with an expanding harrow, which works behind the implement, and brings the weeds to the surface. It is also furnished with two grubbers for stirring the soil to a greater depth than can be done by the hoes.

	£	s.	d.
Price, with 3 shares, marked No. 3, average weight 1 cwt. . . . .	2	15	0
Price, with 5 shares, as above, marked No. 5, average weight 1½ cwt. . . . .	3	10	0
If with expanding harrow, as above . . . . .	extra	0	10

## HOWARD'S PRESS-WHEEL ROLLER.

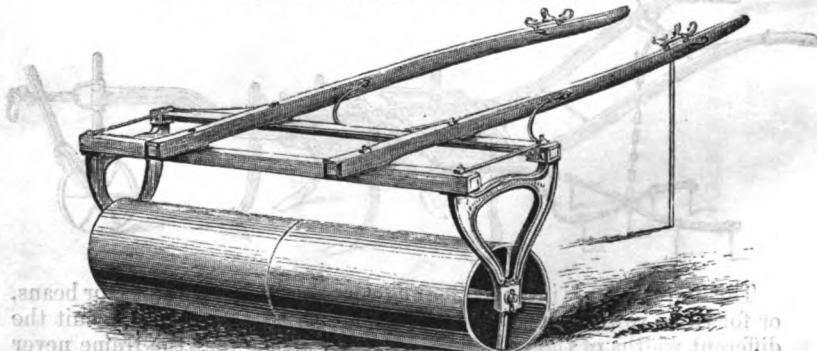


This Roller is composed of a series of cylindrical wheels, with thin cutting edges, revolving separately on a round spindle. For crushing clods, and rolling corn three or four inches out of the ground, upon land infested with wire-worm and grub, it is found a very effective implement. The frame is made of strong wrought angle iron, and the bearings of lignum-vitæ. The scrapers, as shown in the above engraving, will be found very useful, especially on adhesive soil; for, by their use, a slight shower will not put a stop to the work.

		15 in. diameter.	20 in. diameter.	26 in. diameter.
		$\ell$ s. d.	$\ell$ s. d.	$\ell$ s. d.
6 feet wide	..	10 0 0	11 10 0	14 10 0
7 feet wide	..	11 0 0	12 10 0	16 10 0
8 feet wide	..	12 0 0	14 10 0	18 10 0

Scrapers, as above, 30s. extra. Double shafts, 25s. extra.  
The 7-feet Roller, at £16 10s., is recommended as the most useful size.

## HOWARDS' IRON FIELD ROLLER.

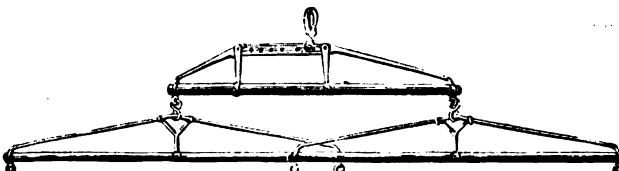


This Roller is made with strong wrought angle-iron frame, wood shafts, turned spindle, lignum-vitæ bearings, and extra strong cylinders.

		£	s.	d.
12 inches diameter; average weight, 8 cwt.		8	8	0
14 inches diameter	9 $\frac{1}{2}$ "	9	9	0
16 inches diameter	10 $\frac{1}{2}$ "	10	10	0
18 inches diameter	11 $\frac{1}{4}$ "	12	12	0
20 inches diameter	12 "	14	14	0
24 inches diameter	15 "	16	16	0

Can be had with double or shifting shafts, or with boxes to weight the roller.

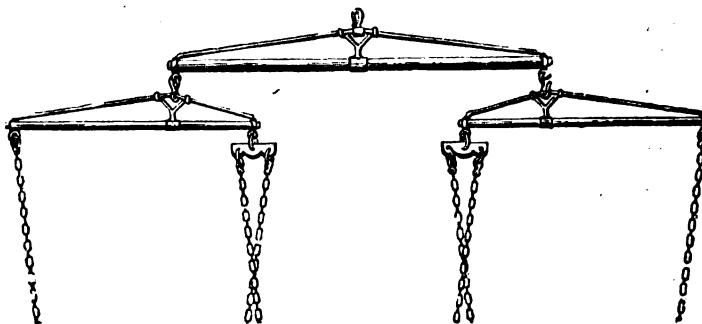
## HOWARDS' TRUSSED WHIPPLETREES.



The above are recommended for their great strength, lightness, and durability. The hinder whiffletree is made with a hake, so that the set can be used with three horses at plough—two in the furrow and one on the land—as well as with a pair abreast; or, when a colt or weaker horse is used by the side of a stronger one, the draught can be regulated accordingly. They are sufficiently strong for four horses.

Price, with wood bars .. .. .. .. .. .. .. .. .. ..	£	s.	d.
Price, with tubular iron bars, as above .. .. .. .. .. ..	0	11	6
Price, with tubular iron bars, for four horses abreast.. .. .. .. ..	0	17	6

## HOWARD'S THREE-HORSE EQUALIZING WHIPPLETREES.



These are made of tubular iron, and are also upon the trussed principle. They are very strong, and are intended for three horses abreast at plough.

Price .. .. .. .. .. .. .. .. .. .. £ s. d.

## HOWARDS' FOUR-HORSE WHIPPLETREES.

The above are intended for four horses. A middle chain is passed round a pulley attached to the head of the plough or other implement ; the fore horses are hooked to one end of the chain, and the hinder horses to the other end, so that no power is lost ; the draught of either horse always telling upon the traction of the implement.

THE FOLLOWING ARE SOME OF THE PLACES TO WHICH  
 J. & F. HOWARD PAY CARRIAGE,  
 When the Goods amount to not less than Twenty Shillings.

ENGLAND AND WALES.

Abergavenny	Dorchester	Lymington	Sheffield
Aberystwith	Dover	Lynn	Shrewsbury
Andover	Downham	Macclesfield	Shifnal
Arundel	Dursley	Machynlleth	Sittingbourne
Ashford	Ely	Madeley Market	Sleaford
Aylesbury	Epsom	Maidenhead	Southampton
Banbury	Evesham	Maidstone	Spalding
Bangor	Exeter	Manchester	Stafford
Barton-on-Humber	Fareham	Market Rasen	Stamford
Basingstoke	Farnborough	Melton Mowbray	Staplehurst
Beverley	Farnham	Mold	Stockport
Bideford	Folkestone	Monmouth	Stourbridge
Birmingham	Gainsborough	Much Wenlock	Stowmarket
Bishop Stortford	Glastonbury	Nantwich	Stratford-on-Avon
Boston	Gloucester	Neath	Swansea
Bradford	Grantham	Newark	Swindon
Bridgend	Grimsby	Newbury	Tadcaster
Bridgenorth	Guildford	Newcastle-on-Tyne	Tamworth
Bridgewater	Halifax	Newmarket	Taunton
Bristol	Hastings	New Milford	Tewkesbury
Buckingham	Haverfordwest	Newport	Tiverton
Burslem	Hereford	Newtown	Tunbridge Wells
Burton-on-Trent	Hertford	Normanton	Ulverstone
Bury St. Edmunds	Hornastle	Northallerton	Uttexeter
Cambridge	Horsham	Northampton	Uxbridge
Canterbury	Hounslow	Norwich	Wakefield
Cardiff	Huddersfield	Nottingham	Warrington
Carlisle	Hull	Oswestry	Warwick
Carmarthen	Huntingdon	Oxford	Watford
Carnarvon	Ipswich	Penrith	Welshpool
Chelmsford	Kidderminster	Peterborough	Whitchurch
Cheltenham	Knighton	Pontefract	Whitcavene
Chepstow	Knotttingley	Poole	Williton
Chester	Lancaster	Portsmouth	Wimborne
Chesterfield	Leatherhead	Preston	Wincanton
Chichester	Ledbury	Reading	Winchester
Chipping Norton	Leeds	Reigate	Windsor
Cirencester	Leicester	Retford	Wisbeach
Colchester	Leominster	Rhyl	Witney
Conway	Lewes	Romford	Wolverhampton
Crediton	Lichfield	Romsey	Worcester
Crewkerne	Lincoln	Ross	Workington
Croydon	Liverpool	Royston	Worksop
Darlington	Llanelli	Rugby	Worthing
Dartford	Llanidloes	Rugeley	Wrexham
Derby	London	Salisbury	Wyeombe
Devizes	Loughborough	Sandbach	Yarmouth
Dewsbury	Louth	Sandwich	Yeovil
Doncaster	Ludlow	Selby	York

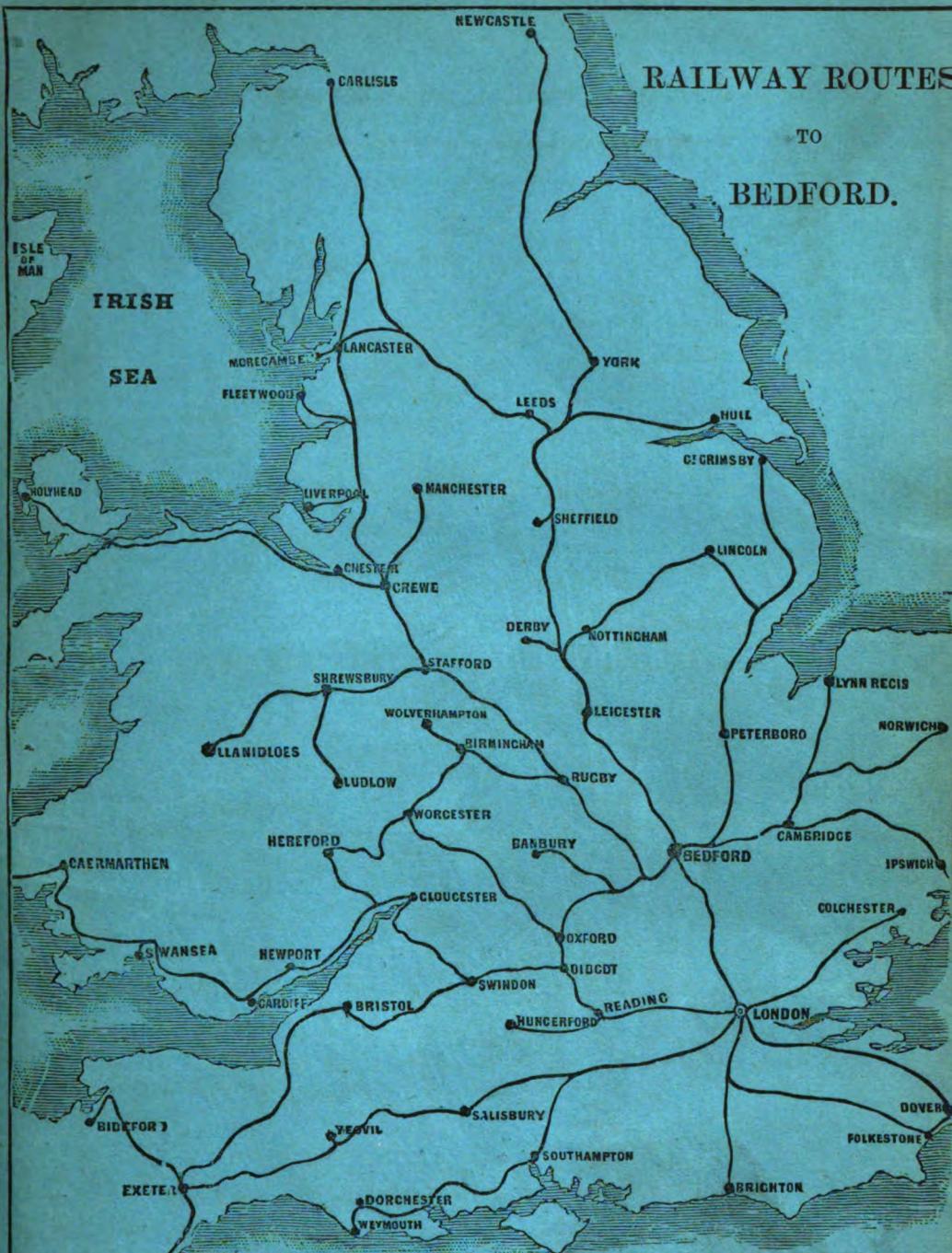
IRELAND.

Belfast	Dublin	Dundalk	Londonderry
And for 2½ per cent. to			
Armagh	Carlow	Kildare	Monaghan
Athlone	Cork	Kilkenny	Nenagh
Athy	Enniskillen	Limerick Junction	Tralee

SCOTLAND.

For 2½ per cent. to

Aberdeen	Dumfries	Edinburgh	Kelso
Ardrossan	Dundee	Glasgow	Perth
Cupar	Dunkeld	Invergordon	Stirling



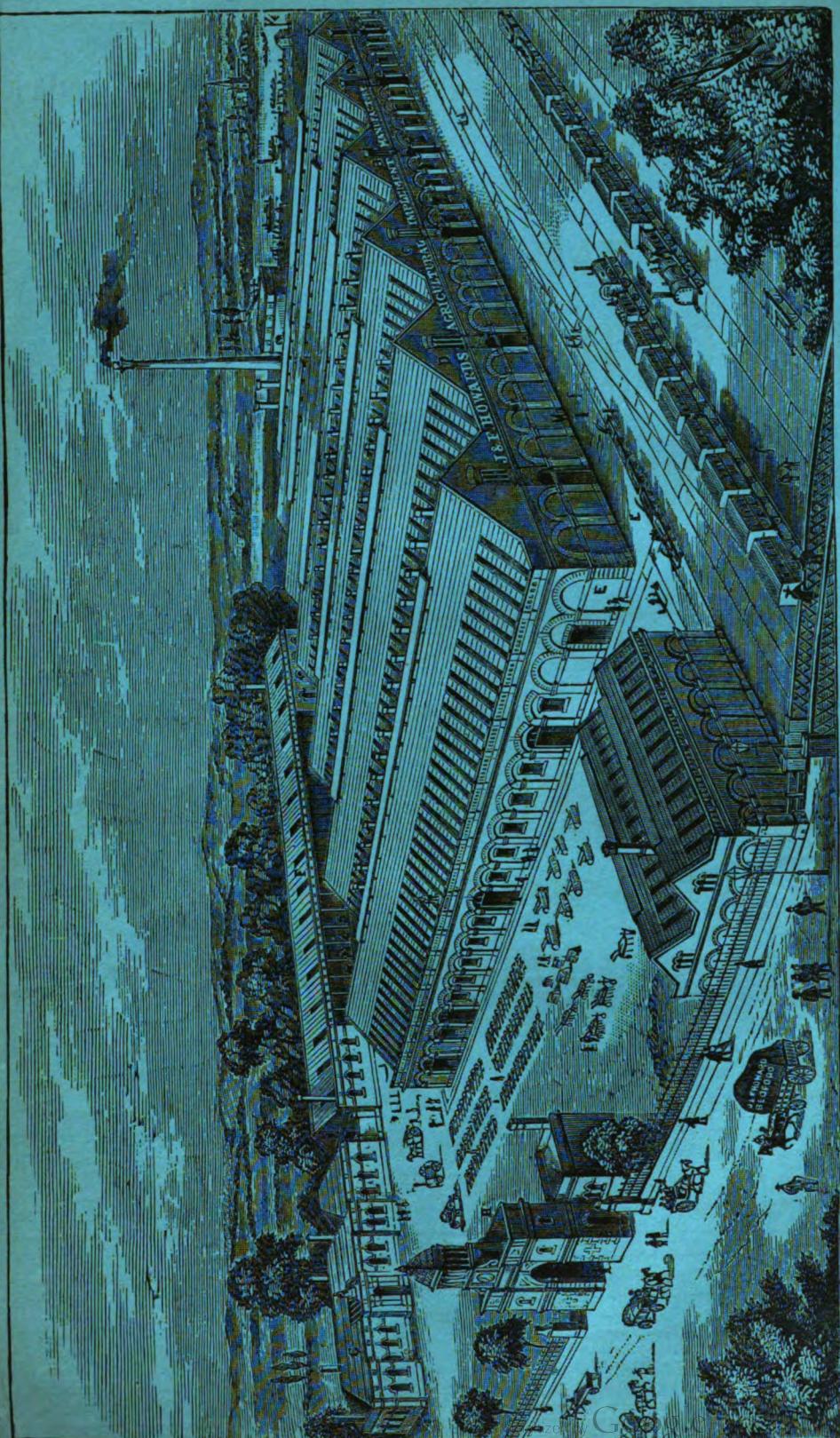
RAILWAY ROUTES  
TO  
BEDFORD.

TIME OCCUPIED IN TRAVELLING TO BEDFORD.

BIRMINGHAM, from New Street Station	-	-	-	-	-	-	-	2½ hours.
BRISTOL, from Great Western Terminus	-	-	-	-	-	-	-	5 hours.
CAMBRIDGE	-	-	-	-	-	-	-	1 hour.
CARLISLE, via Ingleton	-	-	-	-	-	-	-	7½ hours.
LEEDS, from Wellington Station	-	-	-	-	-	-	-	4½ hours.
LIVERPOOL, from Lime Street Station	-	-	-	-	-	-	-	5½ hours.
LONDON, from King's Cross Station	-	-	-	-	-	-	-	1 hour.
OXFORD	-	-	-	-	-	-	-	2 hours.

# THE BRITANNIA IRON WORKS, BEDFORD.

A Foundry. B Engine and Fitting Shop. C Forging Shop. D Forging Shop. E Finishing Shop. F Timber Shops and Stores. G Offices. H Entrance. I Forwarding Warehouse.



CATALOGUE  
OF  
HOWARD'S PATENT  
PLOUGHING ENGINES,  
STEAM CULTIVATORS,  
AND  
STEAM PLOUGHS,  
MANUFACTURED BY  
JAMES & FRED<sup>K</sup>. HOWARD,  
BRITANNIA IRON WORKS,  
BEDFORD.

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LONDON OFFICE:  
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JULY 1, 1867.

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HOWARDS'  
STEAM CULTIVATING APPARATUS  
CAN BE SEEN  
AT WORK ON THEIR FARMS,  
ONE MILE FROM BEDFORD STATION,  
WHICH CAN BE REACHED  
IN AN HOUR BY MIDLAND RAILWAY,  
FROM KING'S CROSS, LONDON.

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For full particulars of  
HOWARDS' CHAMPION PLOUGHES, HARROWS, HORSE RAKES,  
HAYMAKERS,  
and other Agricultural Implements,  
see J. & F. HOWARD'S GENERAL CATALOGUE,  
sent post-free on application.